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Measuring Scenic Beauty: A Selected Annotated Bibliography

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Abstract

Arthur, Louise M., and Ron S. Boster.

1976. Measuring scenic beauty: A selected annotated bibliography. USDA For. Serv. Gen. Tech. Rep. RM-25, 34 p. Rocky Mt. For. and Range Exp. Stn., Fort Collins, Colo. 80521

Of the 167 papers covered, 95 percent date from 1965. Citations are divided into four categories: literature reviews, inventory methods, public involvement, and miscellaneous. Many annotations also carry a "critical comment."

Keywords: Esthetics, land use planning, landscape management, inventory.

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Measuring Scenic Beauty: A Selected Annotated Bibliography

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Louise M. Arthur, Economist, and Ron S. Boster, Principal Economist
Rocky Mountain Forest and Range Experiment Station¹

¹Research supported here was conducted while authors were located at the Station's Research Work Unit at Tucson, in cooperation with the University of Arizona. Station's central headquarters is maintained at Fort Collins, in cooperation with Colorado State University. Arthur is now with the USDA Economic Research Service, Tucson; Boster is with the Division of Program Plans, USDI Fish and Wildlife Service, Washington, D. C.

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Measuring Scenic Beauty: A Selected Annotated Bibliography

INTRODUCTION

Of the 167 papers in this bibliography, 95% date from 1965. Why the sudden interest in measuring scenic beauty? The primary reason seems to center around environmental concerns. Recognition of the need for better integration of environmental concerns with the more easily measured wildland resources and products has resulted in important legislation such as the National Environmental Protection Act, and has surely been a prime factor in the proliferation of scenic beauty assessment techniques. The esthetic consequences of public land management decisions are often the most immediate and noticeable. Yet, public land planners have been at a loss to effectively incorporate the scenic resource into their planning and decision-making processes.

There are several reasons for a bibliography on approaches to scenic assessment. One pertains primarily to researchers in the area; a useful annotated bibliography can be a godsend to a researcher beginning an investigation. Not only can valuable time be saved in searching for citations (known and unknown), but annotations can often tell the researchers enough about a particular article to determine whether a library search or reading is warranted. Critical appraisals provide additional information.

Another reason applies primarily to users of scenic beauty evaluation techniques. There is probably no limit to the number of approaches that can be taken to quantify and/or assess something as elusive as scenic beauty. An annotated bibliography can focus and organize numerous ideas on the subject. Readers can learn what methods are available in order to decide if a new approach must be invented, an existing approach modified, or a previously tested method applied.

Still another reason for a bibliography of this topic stems from our observation of a general lack of attention to published criticism of available approaches. Library research to determine what thinking has already been done is often blatantly overlooked. Hopefully, this bibliography will make the general task of literature review easier.

Finally, this bibliography is needed because so much writing and thinking has been done so recently, and because earlier bibliographies generally have not been confined to techniques and are not always easily available.

In view of the above, this bibliography has the following objectives:

1. To survey and list the literature pertaining to the evaluation of scenic beauty, particularly the scenic beauty of wildlands.
2. To briefly summarize, by way of abstracts, the salient features of various publications.
3. To comment critically on selected references.

Following this introduction are annotated citations of many published works dealing primarily with procedures for assessing, quantifying, or otherwise measuring scenic beauty. The citations are divided into four categories: Literature Reviews, Inventory Methods, Public Involvement, and Miscellaneous. The last category contains procedures for measuring or assessing scenic beauty that either do not fit in any of the other categories or are borderline between one or more categories. We assumed from the start that universal agreement as to which paper belongs in which category (or if a paper actually offered a measurement technique) would be impossible. Many familiar works have been excluded because we felt they did not present a technique.

Most of the annotations are our own. If not, quotation marks show they are taken from the original paper's abstract or summary. In some cases we combined our own words with those of the author. Included with some of the citations is a *listing of headings* or chapters where we felt such a listing would provide useful information. Following most annotations, we have listed the number of references cited.

Many of the annotations carry a "critical comment." For the most part, these comments are our own. Not all such comments are negative, and the absence of critical comments does not necessarily imply we were favorably impressed. We simply critiqued those papers we felt needed comment.

An *author index* is included to assist readers in finding papers by a particular author. The index should reduce problems caused by our often arbitrary inclusion of a paper in one category instead of another.

We hope that this bibliography provides a good overview of available scenic assessment techniques. Because of the intense work in this area, it will probably be somewhat dated as soon as it is published. We hope, however, that it will help other researchers in the exhaustive task of keeping up with the literature in a rapidly developing field.

LITERATURE REVIEWS

This section contains citations, annotations, and critical comments on published works that purport to survey literature related to scenic assessment.

The Aerospace Corp.

[n.d.] Method of scenic alternatives impact by computer: concepts and prospects. 35 p. The Aerosp. Corp., El Segundo, Calif.

Abstract

Provides an extensive list and examples of present and potential techniques for portraying landscapes for visual impact analysis. Includes several types of photography, scale models, mapping, drawing, holography, and computer methods. No refs.

Critical Comments

This is simply a listing and does not provide an evaluation of successes or failures of the various methods.

Cerny, James W.

1972. Landscapes amenity assessment bibliography. Exch. Bibliogr. 287. 8 p. Counc. Plann. Libr., Monticello, Ill.

Abstract

A brief overview of the methodologies and purposes of some selected attempts to assess landscape quality. 45 refs.

Coomber, Nicholas H., and Asit K. Biswas.

1973. Evaluation of environmental intangibles. 77 p. Geneva Press, Bronxville, N. Y.

Abstract

A selected review of quantitative techniques dealing with the evaluation of the intangible benefits and costs of the physical environment. The evaluation techniques are separated into monetary and non-monetary models, with the latter category including esthetic measurement models and attractivity models. The merits and disadvantages of each type of approach are discussed. 321 refs.

Critical Comments

The authors submit that attractivity models are preferable, because "the physical effort involved in visiting a recreation site represents a more positive response to attractivity than a merely stated appreciation of such qualities." However, variables other than "attractivity" and/or esthetic preference may predominate in determining actual use of a site.

Headings

Techniques for the monetary evaluation of environmental intangibles: The use of demand curves; Methods of Evaluation based on willingness to pay; Methods based on 'Alternatives'; Methods based on Expenses; Techniques including secondary benefits: Non-Monetary evaluation of the physical environment; The problem of esthetic measure; esthetic measure techniques; Some problems of esthetic measure models; Attractivity models; The problem of measurement; Some conclusions.

Craik, Kenneth H.

1971. The assessment of places. In *Advances in psychological assessment*. p. 40-62. P. McReynolds, ed. Sci. and Behav. Books, Palo Alto, Calif.

Abstract

Relates personality research to environmental research and discusses some approaches to assessing environments. 129 refs.

Headings

Assessing the physical and spatial properties of places; Assessing the organization of material artifacts in place; Assessing the traits of places; Person perception versus personality assessment; Trait attributions versus trait designations; Selection of observers for assessment projects; Media of presentation; Nature and format of judgments; Adjective procedures; Rating procedures; Other promising techniques; Assessing the behavioral attributes of places; Assessing institutional attributes of places; The value of comprehensive environmental assessments.

Craik, Kenneth H.

1972. Psychological factors in landscape appraisal. *Environ. and Behav.* 4:255-266.

Abstract

Reviews various studies from 1965-1970 that focus on landscape appraisal and esthetics. 44 refs.

Critical Comments

Coughlin and Goldstein (1970, see p. 14) have shown there is more agreement among people making esthetic judgments than preference judgments, indicating that esthetics is only one of several relevant preferences. Craik's good review and criticism make a similar point; unlike quality, preference may be strongly related to "use." The author's point that individual preferences for landscapes should first be separated from the esthetics of landscapes before quantifying the landscape's inherent value is well taken in that context.

Draper, Dianne

1973. Public participation in environmental decision-making. Exch. Bibliogr. 396, 28 p. Counc. Plann. Libr., Monticello, Ill.

Abstract

An extensive listing of sources under the categories of environmental concerns (89), planning and public participation (54), and voluntary interest group studies (interest groups in general (68), environmental interest groups (42), government and environmental quality (89)). Many of the papers are discussions of the subjects rather than methodologies. 342 refs.

Dunn, Michael C.

1974. Landscape evaluation techniques: An appraisal and review of the literature. Work. Pap. Number 4, 68 p. Cent. for Urban and Reg. Stud., Univ. Birm., Birm., England.

Abstract

"This paper attempts to introduce the various techniques for landscape evaluation, to make an assessment of their utility, and to prepare a framework within which experimental work aimed at identifying techniques or more general usefulness can take place." 116 refs.

Headings

The early development of landscape evaluation techniques; Recent development of the measurement techniques; Landscape preference: Relevance and application; The consensus approach: Synthesis or full circle?; A summary of approaches & problems.

Fabos, Julius Gy.

1971. An analysis of environmental quality ranking systems. Recreation Symp. Proc., p. 40-55. U.S. Dep. Agric. For. Serv., Northeast. For. Exp. Stn., Upper Darby, Pa.

Abstract

A review and analysis of the quantitative ranking systems developed during the past decade for measuring environmental quality. The quality ranking systems are divided into three groups: systems to evaluate resources for policy planning, systems to evaluate resources for the purpose of planning and action on interstate, state, and subregional scales, and systems which evaluate the landscape for a single use (e.g., camping or boating). Each quality ranking system is summarized. At the end of each category the environmental ranking procedures within that category are compared with eight criteria which the author has identified as desirable characteristics and outcomes of utilizing an environmental quality ranking technique. The value of ranking systems and problems which have been part of the present development are also discussed. The author calls for people in different disciplines to combine their knowledge and training to extend the comprehensiveness, accuracy, reliability, and universality of ranking systems. 44 refs.

Critical Comments

A good review and discussion.

Fabos, Julius Gy.

1974. Putting numbers on qualities: The rising landscape assessors. Landscape Archit. 64(3):164-165.

Abstract

Review and critique of some methods of landscape analysis, especially those submitted by Iverson, Plattner, Murray, Polakowski, Riote, Fabos, and Smandon. No refs.

Critical Comments

Published references of these models were not included.

Harrison, James D.

1974. The perception and cognition of environment. Exch. Bibliogr. 516. 79 p. Counc. Plann. Libr., Monticello, Ill.

Abstract

Very extensive, broad-ranged bibliography. Measurement and scaling section is a short presentation of general methods. Sections I-VII are annotated. 690 refs.

Headings

Personality and perception: psychological and philosophical views (13); Attitude formation (48); Environmental sensitivity and selection (44); Environmental effects and behavioral manipulation (7); Strategies for change (13); Measurement and scaling (20); Reviews and collections (13); Other materials (532).

Kaplan, Rachael.

1975. Some methods and strategies in the prediction of preference. In Landscape assessment: Values, perceptions, and resources. p. 118-129. E. H. Zube, J. G. Fabos, and R. O. Brush, eds. Dowden, Hutchinson, and Ross, Inc., Stroudsburg, Pa.

Abstract

A review and criticism of some research in landscape assessment. The advantages of visual (vs. verbal) presentation modes

and public (vs. professional) samples of respondents are discussed. 32 refs.

Kates, R. W.

1970. Human perception of the environment. Soc. Sci. J. 22:648-660.

Abstract

"The purpose of this article is to convey some of the diversity of human perceptions of the environment, to draw on specific studies in an attempt to clarify how human beings in different social and cultural settings perceive the environment and react to it. For this purpose, I have selected four research themes from the body of literature: the use of illusion to infer the reality of visual perception, the quest for the image of the city, the interplay of environmental attitudes and landscapes, and the adjustment of drought as environmental behavior." 36 refs.

Critical Comments

Section on landscape perception is extremely short and general.

Ottar, Tom.

1974. Kenneth Craik's environmental psychology: An overview and bibliography. Exch. Bibliogr. 677. 28 p. Counc. Plann. Libr., Monticello, Ill.

Abstract

"Methodological influences from psychology and philosophy are traced and Craik's method of using these to structure the field of environmental psychology is outlined. His three subsequent research paradigms [models] based on person perception research are described in some detail, listing relevant methodology, citing examples, and making clear his terminology. Attempts are made to establish connections with other relevant fields of study like geography, clinical psychology, i.e. personality assessment, and human ecology, and with specific approaches to environmental psychology like those employed by the ecological psychologists; the aim of this paper being to convey Craik's views of a field of study in which his participation has not gone unnoticed. The paper is concluded by a short critical note." 36 refs.

Redding, Martin J.

1973. Aesthetics in environmental planning. Socioeconomic Environ. Stud. Ser. 187 p. U.S. Environ. Prot. Agency, Washington, D.C.

Abstract

"This report addresses the relationship of aesthetics to environmental planning. The primary emphasis of the research is on the man-environment interaction, with the ultimate goal directed toward improving the understanding of aesthetic concepts and the implication of using those concepts in research and planning activities. The historical development of the Western concept of aesthetics is explored with the aim of showing the relation of the concept to the particular set of attitudes at each period, to illuminate the way in which present concepts relate to today's world. Three primary aspects of the aesthetic concept are discussed; these include aesthetics and the human senses, aesthetics as thinking about the arts, and aesthetics as the science of beauty. Additional factors underlying the concept of aesthetics include: nature as an underlying force; cultural, social and economic phenomena as determiners of aesthetic expression; and aesthetics of American city life. Aesthetics is also discussed in the context of the National Environmental Policy Act.

Methodologies for measuring or quantifying aesthetics are reviewed, as well as a review of the state of the art of research in basic theory for understanding the unquantifiable. A similar

review of selected planning agencies' guidelines and procedures for integrating aesthetics into the planning process is followed with an outline of suggested future research needs." 216 refs.

Critical Comments

Coverage of the topic is broad and the report is thorough, well organized, and well written.

Saarinen, T. R.

1969. Perception of environment. Comm. Coll. Geogr., Resour. Pap. Number 5. 26 p. Assoc. of Am. Geogr., Wash. D.C.

Abstract

Review of research by social scientists on man's perception of and effect on the environment. Paper is organized to cover topics from perception of small scale to large scale spaces. 7 refs.

Headings

Characteristics of the field; Perception studies organized according to scale; Personal space and room geography; Perception of architectural space; Neighborhoods or districts; Paths and roads; The city; Larger conceptual regions; The country; The world.

Shafer, Elwood L., Jr.

1967. Forest aesthetics — a focal point in multiple-use management and research. 14th IUFRO Congr. Pap. 7, Sect. 26, p. 47-71. [Munich, Ger., Sept. 4-9, 1967.]

Abstract

Presents a sampling of the many innovations that managers and researchers are applying to the problems of integrating timber production and forest esthetics. Past research is reviewed and potential research proposed. The author also presents findings of a survey of managers' estimates of the number of years required for various forests to completely recover from various treatments. 32 refs.

U.S. Senate, Committee on Interior and Insular Affairs.

1973. National environmental policy Act of 1969. Environmental indices status of development pursuant to sections 102(B) and 204 of the Act. 46 p. Environ. Policy Div., Congr. Res. Serv., Libr. Congr., U.S. Gov. Print. Off., Wash. D.C.

Abstract

Reviews the problems of indexing environmental quality and the state of the art in measuring several categories of quality indices: air quality, water quality, pesticides and toxic substances, radiation, noise pollution, recreation. 46 refs.

Veal, A. J.

1974. Environmental perception and recreation: A review and annotated bibliography. Res. Memo., 58 p. Univ. Birm., Birm., England.

Abstract

A review of British and international research on perception and user attitudes in recreation. Contains an annotated bibliography of some 400 items. 400+ refs.

Wyckoff, J. B.

1971. Measuring intangible benefits: Some needed research. Water Resour. Bull. 7(1):11-16.

Abstract

A brief review of some of the methods available for valuing esthetic and recreational resources. 19 refs.

Critical Comments

Few details are provided.

INVENTORY METHODS

References in this section are inventories of physical and/or visual aspects of environments. Often they are quantitative inventories, i.e., inventoried items are converted by various means to arrive at numerical measures or ratings of environmental factors or of whole environments. The generated numbers may have a reasonable rationale behind them; most of the time, however, they do not.

Battelle Memorial Institute.

1973. Development of the Arizona environmental and economic tradeoff model. 172 p. Battelle Columbus Lab., Columbus, Ohio.

Abstract

A computer model was developed to describe environmental impacts of economic and demographic change and to evaluate trade-offs between economic development and environmental quality. Esthetics is one of the 4 categories of environmental quality studied, and is divided into 6 subcategories: land, air, water, biota, man-made objects, composition. All categories and subcategories are given numerical weightings to indicate importance. 21 refs.

Critical Comments

A comprehensive and seemingly sophisticated model, but no justification is given for the arbitrary weightings of elements of environmental quality. The model (ATOM) is dependent on users' subjective appraisals. ATOM has some utility, if used as a gaming/sensitivity model.

Burke, Hubert D., Glen H. Lewis, and Howard W. Orr.

1968. A method for classifying scenery from a roadway. Park Pract. Dev. Guidl. 22(1):125-141.

Abstract

A classification inventory system which evaluates the roadside environment in three observation zones (roadside zone, outer zone, and far zone) is presented. The procedure is based on comparisons of each of the viewing zones to the "characteristic landscape" for that zone. Photographs of 26 landscapes are evaluated to illustrate the application of the rating system. 6 refs.

Critical Comments

The identification of the viewing zones is arbitrary, but probably useful. The impact of man-made structures on the landscape is primarily dependent on the perceptual bias of the observer and the particular structure and cannot be evaluated uniformly as the authors imply.

Dearinger, John A.

1968. Esthetic and recreational potential of small naturalistic streams near urban areas. 260 p. Univ. of Ky. Water Resour. Inst., Lexington.

Abstract

"The purpose of this study was to find a way to evaluate the esthetic and recreational potential of small streams and their watersheds. Research was limited to naturalistic streams with drainage areas under 100 square miles and located within 25 miles of a city. A methodology, based on some previous work of the U.S. Soil Conservation Service and the principles or concepts of terrain analysis, land use planning, value judgment philosophy and the economics of outdoor recreation, was developed and applied in detail to two streams near Lexington, Kentucky.

Evaluations were made of the streams' potential for camping (primitive, transient and group), fishing, picnicking, a trail system (hiking, horseback riding, bicycling and auto tour routes), esthetic enjoyment (sightseeing, nature walks and walking for pleasure) and the establishment of natural, scenic and historic areas. Limited applications were also made to two other watersheds and to selected recreation sites on Boone and Jessamine Creeks. Extensions of these case studies resulted in procedures for estimating visitation to a developed site, future participation demand generated by an urban area and the proportion of that demand that would be satisfied at a specific site, and the economic benefits that would accrue if the sites were developed." 82 refs.

Critical Comments

This massive report presents a detailed, exhaustive, professional inventory and evaluation of the watersheds, but does not include public evaluations of the esthetic and recreational potential of the areas. The importance of public opinions is acknowledged in the section on public demand analysis; public opinions can be incorporated directly in the evaluation stages.

Fines, K. D.

1968. Landscape evaluation: A research project in East Sussex. Reg. Stud. 2:41-55.

Abstract

"A method of landscape and townscape evaluation is described. A worldwide scale of values was devised by testing a selected group with photographs to remove personal bias. A network of view evaluations is converted to land-surface values. A micro-evaluation of East Sussex is set against an outline evaluation of Britain; 'regional landscape value profiles' with parameters being illustrated. Applications of the technique and an example of route selection for a supergrid transmission line are explored. Methods of defining conservation areas by statistical techniques are described and a plea made for the recognition of areas important in relation to population and accessibility." 3 refs.

Critical Comments

Brancher, D. M. 1969. Critique of K. D. Fines: landscape evaluation. A research project in East Sussex. Reg. Stud. 3:91-92. Brancher objects to Fine's selecting only respondents with "considerable experience in design", assigning cardinal values to ordinal scales, representing extreme variety of landscapes with only 20 photographs, and other questionable criteria.

Hamill, Louis.

1971. Classification of forest land for recreational potential and scenery. For. Chron. 47(3):149-153.

Abstract

Proposes an intensive landscape inventory system including (1) reconnaissance, (2) identification of planned uses, (3) rating visual scenic attributes, (4) rating water attributes, (5) identifying and mapping needs for development, and (6) classifying for zoning and other policy decisions. In categories 3 and 4 the author

suggests analyzing landscapes, using such criteria as beauty, contrast, and harmony. The proposals are presented as general suggestions, not as detailed, organized procedures. 18 refs.

Critical Comments

The idea of using a standard landscape is good, though standardization can also be accomplished mathematically from quantitative evaluations.

Hamill, Louis.

1974. Statistical tests of Leopold's system for quantifying aesthetic factors among rivers. Water Resour. Res. 10(3): 395-401.

Abstract

"Leopold has published a set of techniques for comparing aesthetic factors among rivers, which include uniqueness ratios and graphic derivations of scale of river character and scale of valley character. The usual practice in evaluating Recreational and Scenic Resources is to use a consistent rating scheme and to derive summary measures of attractiveness by adding evaluation numbers or ratings. The latter procedures were used to test Leopold's methods by using the Spearman rank correlation coefficient to compare rankings by the two methods. There was poor correlation between evaluation numbers and uniqueness ratios for physical and water quality factors. Correlation was better for human use and scenic factors. The graphic procedures were found to introduce unexpected anomalies in combining two or more sets of factors, and the addition of evaluation numbers requires less time and effort than the procedures advocated by Leopold and is less subject to errors." 6 refs.

Critical Comments

A good critique of Leopold's method, but the alternative presented is not without fault either.

Headings

Statistical tests of ranking for selected factors; Rankings for scale of valley character; Rankings for scale of river character; Analysis of graphic derivations.

Handley, Rolland B., T. R. Jordan, and William Patterson.

1969. An environmental quality rating system. 45 p. U.S. Dept. Int., Bur. Outdoor Recreat., Northeast Reg. Off., Phila., Pa.

Abstract

Describes a system designed for rating the quality of natural and urban environments. "There are three numerical elements — base values, weighting factors and negative factors — values are arbitrary at this time. . . ." Eight categories or fields of interest were selected for rating. These were community resources, resident populations, landforms, leisure resources, vegetation, fish and wildlife, historical and archaeological matter. Each of 4 to 8 factors within a category is assigned a maximum achievable base value. The rater then decides how much of each factor is found in an area. Factors are also weighted before ratings are summed. Negative factors are then subtracted. 10 refs.

Critical Comments

Authors acknowledge their system is arbitrary, but recommend it for multiple ratings of one area, i.e., for measuring environmental changes. However, system arbitrariness is no less dangerous for such applications. Less arbitrary models are presently available.

Hart, William J., and William W. Graham.

1967. How to rate and rank landscapes. *Landscape Archit.* 57(2):121-123.

Abstract

A scheme to evaluate landscapes is based on the assumption that "a richly textured landscape offering many visual contrasts, enhances the environment" for recreational use. The procedure used to identify potential scenic recreational areas is to locate "folded" (vs. "smooth") areas on topographic maps using scales of 1:250,000 and 1:50,000 and to rate the areas identified according to various physical and biological factors present. The procedure is primarily an inventory method and is designed for use on a large regional scale. No refs.

Critical Comments

No empirical evidence is presented to justify the rating and ranking of elements selected.

Helliwell, D. R.

1967. The amenity value of trees and woodlands. *J. Arboric. Assoc.* 5:128-131.

Abstract

Each of seven factors "involved in determining the amenity value of a tree or wood" is assigned a rating from 1 to 4. Factors include crown area, life expectancy, position importance, presence of other trees, form, species in relation to setting, and special or historical value. Numerical ratings "are then multiplied together to give a figure corresponding to the amenity value. This figure can, in turn, be multiplied by a constant figure to obtain a monetary value. 1 ref.

Critical Comments

Model is extremely arbitrary.

Iowa State University, Department of Landscape Architecture.

1969. *Souris-Red-Rainy River Basins*. 54 p. Dep. Landscape Archit., Iowa State Univ., Ames.

Abstract

Presents professional evaluations of the esthetics of three river basins. The study was conducted in three stages: (1) research concerning the physical features of the areas, (2) reconnaissance (air and field) and photography, and (3) synthesis. Evaluations are presented as verbal descriptions. General management recommendations are made. 18 refs.

Critical Comments

Provides only descriptive evaluations, not a systematic methodology that could be used by others.

Iverson, Wayne D.

1975. Assessing landscape resources — a proposed model. *In* *Landscape assessment: values, perceptions and resources*. p. 274-288. Ervin H. Zube, Robert O. Brush, and Julius Gy Fabos, eds. Dowden, Hutchinson, and Ross, Inc., Stroudsburg, Pa.

Abstract

Presents a technique for landscape assessment that is applicable to land areas in the range 25,000 to 250,000 acres. The use of VIEWIT (a seen-area computer program, Elsner 1971) is illustrated. A theoretical model is proposed for use with the VIEWIT

program to quantify landscape assessment. When combining categorical parameters through the use of VIEWIT and appropriate subroutines to obtain the total visual impact, equal weightings for all categories are suggested unless variable weightings can be justified experimentally. Scenic quality is rated on a 3 point scale based on variety. 19 refs.

Critical Comments

Perhaps equal weightings also should be justified experimentally. Equal weightings are just as arbitrary as unequal weightings.

Headings

Smith river highway visual analysis study; Mineral king visual analysis; A proposed model for landscape assessment quantification; Social sensitivity of the landscape view (types of viewers); Visual perception sensitivity (screening; angle of viewer land plane, distance); Contrast reduction potential (inherent ability, action to reduce contrast); Weighting systems.

Johnson, Christine G.

1974. *Mineral King visual analysis*. 52 p. U.S. Dep. Agric. For. Serv., Calif. Reg., San Francisco.

Abstract

Illustrates a method of combining the VIEWIT computer program (Elsner 1971) with the "Visual Resource Management System" as outlined in *National Forest Landscape Management*, Vol. 2 (USDA 1974). The output consists of computer maps of "scenic quality" (variety) and "ability to absorb visual modification" (based on texture analysis) and composite maps based on the number of times an area is seen (from a proposed travel corridor), angle of view, distance, ability to absorb visual modification and scenic quality. 1 ref.

Johnson, Hugh A., and Judith M. Huff.

1966. Toward measuring the intangible values of natural beauty. *Proc. 21st Annu. Meet. Soil Cons. Soc. of Am.*, 5 p. U.S. Dep. Agric., Econ. Res. Serv., Wash. D.C.

Abstract

The need to develop specific procedures to measure and evaluate beauty is necessary if esthetic concerns are to be incorporated into planning and management programs. The concept of beauty is discussed and Lewis' linear corridor theory for inventorying environmental values of landscapes is presented. 10 refs.

Jones, Grant R., Ilze Jones, Brian A. Gray, Bud Parker, Jon C. Coe, John B. Burnham, and Neil M. Geitner.

1975. A method for the quantification of aesthetic values for environmental decision making. *Nuclear Tech.*, 25:682-713.

Abstract

"The methodology for quantitative evaluation of visual impact considers the appearance and visual quality of a landscape setting as viewed from a series of representative viewpoints "before" and "after" the introduction of a nuclear facility. Procedures to select representative viewpoints are based on facility visibility from the surrounding area, viewing distance, observer position, and impacted viewing populations. A duplicate photo or slide taken from each representative viewpoint is touched up to portray the viewscape condition with the facility. The visual quality of each condition is then evaluated by applying the scaled measurements of intactness, vividness, unity, and importance of the major viewscape components, and these scores combined into a formula

yielding a visual quality rating from 1 to 100. Total visual impact of a proposed facility is the sum of visual impacts measured at each representative viewpoint, with the difference between before and after conditions expressed in terms of percent of change modified by population viewing contact. An expression of the relative scarcity or uniqueness of the potentially impacted landscapes serves to protect remote areas and unique natural and cultural features."

Critical Comments

The procedure is thoughtful, comprehensive, and appears to work. However, the quantitative, systematic rigor, and apparent objectivity mask the underlying arbitrariness of the approach. Especially arbitrary are the relative weights of the various components (e.g., 1:1). Empirical verification of the relative weights and the functional relationships are needed to validate the procedure.

Kaiser, Edward J., Karl Elfers, Sidney Cohn, and others.

1974. Promoting environmental quality through urban planning and controls. Socioeconomic Environ. Stud. Ser., EPA-800/5-73-015, 441 p. Off. Res. and Dev., U.S. Environ. Prot. Agency, Wash. D.C.

Abstract

Section on land use planning (p. 107-182) is the most relevant to visual landscape analysis. Several inventory methods are reviewed and the problem of assessing visual quality discussed. Most of the volume deals with problems of managing environmental quality. 462 refs.

Headings

Changing awareness and practice: perspectives of the 60's, the current scene in local and metropolitan planning agencies. Promising approaches: land use planning, water resources management, urban design, planning and residuals management.

Kiemstedt, Hans.

1967. Zur Bewertung der landschaft für die Erholung. (Evaluation of the Natural Components of Recreational Landscapes.) Verlag Eugen Ulmer, Stuttgart, Ger. 150 p.

Abstract

Presents an evaluation system based on identification and quantitative ratings of various factors contributing to landscape quality (e.g., relief, water, grasslands, climate, edges). Various uses of scenic areas and distances from cities, etc., are also rated and are to be used as weights in determining the final score, "Vielfaltigkeitswert" (related to variety). 117 refs.

Critical Comments

Though written in German, it is included because of extensive (117) citations of relevant German literature.

Land Use Consultants

1971. The planning classification of Scottish landscape resources. 126 p. Countryside Comm. Scotl., Woods of Perth, Ltd., Perth, Scotl.

Abstract

Presents a detailed survey and classification of Scottish landscapes, based on analyses of maps, air photographs and field observations. Primary classifications are derived from measurements of landform + ground cover. Subclasses are based on the presence of water, "point artifacts" (e.g., settlements, buildings)

and communication networks. An inventory is made of the quality of landscape elements within each class. 177 refs.

Critical Comments

Authors suggest that public input would be valuable, but depend primarily on professional analyses. The volume is well illustrated and includes an extensive bibliography.

Leopold, Luna B.

1969a. Landscape esthetics. Nat. Hist. 78:36-45.

Abstract

An inventory method of esthetic quantification was developed to assess the esthetic uniqueness of Hell's Canyon as compared to 11 other river valleys in Idaho. No refs.

Critical Comments

See following reference.

Leopold, Luna B.

1969b. Quantitative comparison of some aesthetic factors among rivers. Geol. Surv. Circ. 620, p. 1-16. U.S. Dep. Int. Geol. Surv., Wash. D.C.

Abstract

Uniqueness ratios, based on physical factors, biologic and water quality, and human use and interest (consisting of a total of 46 esthetic factors), were developed for 12 Idaho River sites and 4 National Park river sites. A graphic/geometric projection technique was used. No refs.

Critical Comments

An early and innovative article. The author performed all ratings. Since the author defined the factors and then rated them, the potential for bias is inherent. Quantitative problems may arise from the lack of a theoretical foundation for definitions and averaging of ordinal data. Some of the potential criticisms are recognized by the author. No refs.

Leopold, Luna B., Frank E. Clarke, Bruce B. Hanshaw, and James R. Balsley.

1971. A procedure for evaluating environmental impact. Geol. Surv. Circ. 645, 13 p. U.S. Dep. Int. Geol. Surv., Wash. D.C.

Abstract

"This report contains a procedure that may assist in developing uniform environmental impact statements. The heart of the system is a matrix which is general enough to be used as a reference checklist or a reminder of the full range of actions and impacts on the environment that may relate to proposed actions." The matrix consists of 100 actions which cause environmental impact and 88 environmental conditions that might be affected. Each relevant action is then checked and evaluated on a 10-point scale of the magnitude and importance of the expected impact on environmental characteristics. 3 refs.

Critical Comments

The authors submit that "assignment of numerical weights to the magnitude and importance of impacts should be, to the extent possible, based on factual data rather than preference," but offer no systematic methods for doing so.

Leopold, Luna B., and Maura O'Brien Marchand.

1968. On the quantitative inventory of the riverscape. *Water Resour. Res.* 4(4):700-717.

Abstract

"In the vicinity of Berkeley, California, 24 minor valleys were described in terms of factors chosen to represent aspects of the river landscape. A total of 28 factors were evaluated at each site. Some were directly measurable, others were estimated. . . ." Each factor was rated on a 5-point scale to derive a uniqueness ratio. 8 refs.

Critical Comments

The descriptive inventory and uniqueness ratio procedures are, in part, dependent on the evaluators' perceptions and the 28 factors (chosen a priori). The authors recognize these weaknesses in the procedure and indicate directions for further study.

Lewis, Philip H., Jr.

1964. Quality corridors for Wisconsin. *Landscape Archit.* 54(2):100-107.

Abstract

A team of experts from different academic disciplines (soil scientists, botanists, architectural historians, anthropologists, foresters) inventoried the natural and scenic resources of the state of Wisconsin. Upon comparing areas of unusual resource potential selected by each discipline, it was discovered that geographic areas determined to be most desirable often coincided and formed linear patterns or "corridors" when projected on the state map. Optimal use and benefit from these environmental corridors is suggested through preventing development within them and encouraging cluster development on fringe areas. No refs.

Critical Comments

It may be possible to enhance areas or improve access to their unique beauty by development; preventing development is not always the best answer. This is primarily an inventory method, and as such cannot in itself predict the effects of change.

Linton, David L.

1968. The assessment of scenery as a natural resource. *Scott. Geogr. Mag.* 84:219-238.

Abstract

Derives esthetic quality ratings from maps of Scotland showing the regional variation of landform character and the distribution of land use. Various categories of landforms and land uses are rated from 0-8 and from -5 to +6, respectively. "Bonus points" may be given to special features within a category. The summed scores are then used to construct a composite assessment map. The map was "validated" by the subjective assessment of 2 professionals. 6 refs.

Critical Comments

Scales are arbitrary and based on subjective judgments of the author. The author does note, however, that his judgments are influenced by and represent social values.

Litton, R. Burton, Jr.

1968. Forest landscape description and inventories -- a basis for land planning and design. USDA For. Serv. Res. Pap. PSW-49, 64 p. Pac. Southwest For. and Range Exp. Stn., Berkeley, Calif.

Abstract

Describes six analytical factors and seven compositional types useful in recognition and description of scenic resources. Their application is illustrated by two inventories made to aid managers and landscape architects in planning and design. 45 refs.

Critical Comments

Well illustrated, detailed descriptions of the variables; however, some previous design experience may be necessary if variables are to be used consistently and effectively for scenic evaluations.

Headings

Factors of scenic analysis and observation; Distance (foreground, middleground, background); Observer position (inferior, normal, superior); Form; Spatial definition; Light (color, distance, direction); Sequence; Composition (panoramic, feature, enclosed, focal, undergrowth, detail and ephemeral landscapes); Landscape inventories.

Litton, R. Burton, Jr.

1972. Aesthetic dimensions of the landscape. *In* Natural environments: studies in theoretical and applied analysis. p. 262-291. John V. Krutilla, ed. Johns Hopkins Univ. Press, Baltimore, Md.

Abstract

The following generalized attributes of the landscape are identified: primary factors of recognition (form, space, and time variability), secondary factors of recognition (observer position, distance, and sequence), and six compositional landscape types: (1) panoramic landscape, (2) feature landscape, (3) enclosed landscape, (4) focal landscape, (5) forest (canopied) landscape, (6) detail landscape. Three esthetic criteria are suggested for evaluating landscapes: unity, vividness, and variety. To include landscape as a resource in planning studies there must be, first, an awareness of landscape aesthetics and, second, an esthetic landscape inventory that catalogues esthetic qualities. Esthetic inventories can be summarized on topographic maps through route studies (utilizing photographs, sketches, notes, symbols) of a specific visual corridor, or through reconnaissance of particular areas. Aerial photography, following field sampling procedures, provides a useful way to develop large scale inventory maps. Landscape inventories can provide a display against which specific planning strategies can be tested to determine the effect on esthetic qualities of the landscape. 40 refs.

Critical Comments

Craik's paper (1972, see p. 2) which appears in the same book, tests the usefulness of Litton's esthetic landscape dimensions scale.

Headings

Attributes of the landscape; Recognition factors; Form, space, time variability; Secondary recognition factors; Landscape compositional types; Aesthetic criteria; The landscape as a resource.

Litton, R. Burton, Jr.

1973. Esthetic resources of the lodgepole pine forest. *Manage. Lodgepole Pine Ecosyst. Symp.*, 14 p. Pullman, Wash., Oct. 9-11, 1973.

Abstract

"The lodgepole pine forest is examined from two standpoints: broad overviews and detailed observation from within — the nearview. The broad ecological amplitude of the species is recognized, but its role in the Rocky Mountain landscape is emphasized." 6 refs.

Critical Comments

A professional's discussion, not a proposed methodology.

Headings

The forest from outside (overviews); Land forms and water bodies; Vegetation type patterns, soils, & microclimates. The forest from inside (closeviews): Floor elements; Elements of types and stands.

Litton, R. Burton, Jr.

1974. Visual vulnerability of forest landscapes. *J. For.* 72(7): 392-397.

Abstract

"Certain characteristics can help predict the landscape's vulnerability or resistance to such man-made visual impacts as roads or timber harvest. The planner must recognize (a) landscape compositional types, (b) sensitive parts and locations, and (c) outside influences and inherent effect, such as orientation, climate, seasons, slope, and soil and vegetation surfaces. Some ranking on levels of visual vulnerability are suggested." 10 refs.

Critical Comments

Discusses the potential of nondetectable management of landscapes. Detectable manipulations can sometimes enhance scenic beauty, however.

Litton, R. Burton, Jr., Robert J. Tetlow, Jens Sorensen, and Russell A. Beatty.

1971. An aesthetic overview of the role of water in the landscape. *Natl. Tech. Inf. Serv.* PB 207 315, 283 p. U.S. Dep. Comm., Springfield, Va.

Abstracts

"Emphasizing the aesthetic aspect of fresh water in the landscape, this report explores the contributions of water to the environments of recreation and everyday life. To identify the values of water in this role, a classification framework is developed for native characteristics and these are considered together with man-made changes. Concentrating upon the visual landscape, the classification identifies *landscape units*, and *waterscape units*. Inventories of existing conditions as well as man-made elements and improvements are related to the characteristics of the units.

The scope of the study includes evaluation comparisons and suggests tangible ways in which water and its treatment can contribute to environmental quality. Also included are recommendations for needed policies, planning guidelines and research that should better promote environmental enhancement through relationships with fresh water streams and bodies."

Headings

Description and classification framework: Classification; Inventories; Evaluation. Classification of manmade elements and improvements related to the landscape setting and waterscape units; Structures and alterations in the landscape unit; Structures and alterations in the setting unit; Structures and alterations in the waterscape; Evaluation of manmade structures and alterations in the water identified landscape.

Litton, R. Burton, and Robert H. Twiss.

1967. The forest landscape: some elements of visual analysis. *Proc. Soc. of Am. For. Meet.*, p. 212-214. Wash. D.C., 1967.

Abstract

"...purpose is to describe six factors of observation and scenic composition, to comment on their relevance to resource management, and to suggest the range of variation in their importance. They are: (1) distance, (2) light, (3) topographic form and contrast, (4) spatial definition, (5) observer position, and (6) sequence." 4 refs.

Critical Comments

Relevance and importance of these factors have not been validated empirically.

McHarg, Ian.

1966. *Design with nature*. 198 p. Nat. Hist. Press, N.Y.

Abstract

Graphically presents suitability of land for various uses, e.g., types of recreation, urbanization, based on physical features of the environment (also mapped). Emphasizes ecological perspectives. No refs.

Critical Comments

Evaluation of which types of landforms are appropriate for which land uses is based only on professional experience.

Headings

Introduction; City & countryside; Sea & survival; The plight; A step forward; The cast and the capsule; Nature in the metropolis; On values; A response to values; The world is a capsule; Processes as values; The naturalists; The river basin; The metropolitan region; Process and form; The city: process & form; The city: health and pathology; Prospect.

Melthorn, W. N., and E. A. Keller.

1973. Landscape aesthetics numerically determined. *Highw. Res. Rec.* 452:1-9.

Abstract

"The LAND ("landscape aesthetics numerically determined") system provides a preliminary method to quantify esthetic factors of a landscape and to visually inspect hierarchically ranked alternatives. The model is an extension of Leopold's concept of landscape uniqueness. Descriptive evaluation numbers for various landscape factors are used to derive indexes (of uniqueness) which are then used to evaluate and compare different landscapes." Topographic maps, aerial photos, and field work are employed. 1 ref.

Critical Comments

See criticisms of Leopold's methods (above) and Hamill (1974).

Methven, Ivan R.

1974. Development of numerical index to quantify the aesthetic impact of forest management practices. *Inf. Re.* PS-X-SI, 20 p. Petawa For. Exp. Stn., Chalk River, Ont., Can.

Abstract

Develops a simplified numerical index to quantify the esthetic impact of forest practices on particular stands or operating units, by hypothesizing an idealized normal observer on the basis of a

common empathy and the dominance of the visual response in human esthetic relations with the natural environment. The index is constructed from six esthetic variables which are assigned equal values in the form of arbitrary units, and which are selected on the basis of stated requirements and components: (1) species diversity or variety, (2) structural complexity, (3) forest view, (4) slash visibility, (5) pattern, and (6) boundary form.

A method for incorporating the index into a total economic-esthetic evaluation is also presented. 19 refs.

Critical Comments

The author attempts to place esthetic and economic values in the same model; however, the derivation of the former is quite arbitrary. Further, the assumption of "common empathy" needs to be validated (see Hendee and Harris 1970).

Michalson, E. L.

1970. A methodology for evaluation of wild and scenic rivers. 8 p. Water Resour. Res. Inst., Univ. of Idaho, Moscow.

Abstract

"The procedure adopted is to study — more or less independently, at first — fourteen subprojects each involving an activity related to the river. . . First, individual researchers will inventory the physical, biological, and human resources affecting each subproject. Second, the inventory data obtained will be used to make an economic evaluation of the current use of these resources and the potential benefits available from them. Third, these data will be used as a basis for projecting future resource use and values. . ." Results are published separately by the Institute. No refs.

Murray, Timothy, Peter Rogers, David Sinton, and others.

1971. Honeyhill: A systems analysis for planning the multiple use of controlled water areas. Inst. Water Resour. Rep. 71-9, Vol. 1 and 2, U.S. Army Engrs., Alexandria, Va. 726 p.

Abstract

"The first phase of the study was an inventory by map subdivisions of the existing resources of the Honeyhill area. . . The data on the area were stored, analyzed and displayed using computer graphic techniques developed by the investigators. The second phase. . . was the development of quality indices for visual quality, ecological damage, wildlife habitat, etc., which utilized pertinent parameters from the resource inventory. The quality indices were then related to possible land uses including recreation. Finally, the grid areas of Honeyhill were evaluated and ranked in terms of various uses. . . The third state. . . was the development and investigation of possible planning evaluation approaches" using a simulation model. 168 refs.

Critical Comments

The computer graphics are sophisticated and impressive and offer promise for resource planning and decision-making. Indeed, much of the "Honeyhill" work has been applied. One problem with this particular study is that "attractiveness" is defined by professional judgments only.

Ontario Ministry of Natural Resources

[n.d.] Design guidelines for forest management. 181 p. Hough, Stansbury and Assoc. Ltd., Toronto, Can.

Abstract

A manual "which attempts to establish practical guidelines that will be useful to the resource planning team at district and

regional level. . ." Presents detailed professional analysis of esthetic problems confronted in forest management. 70 refs.

Critical Comments

Authors note that "recent research has shown that the visually trained individual can, and does, represent the majority opinion of the general public" is perhaps too much of a generalization. Manual is extremely well organized and designed.

Headings

Planning for management; Forest management area; Manual framework (site protection, aesthetics); Roads — site protection; Roads — aesthetics; Landings — site protection; Landings — aesthetics; Cutting — site protection; Cutting — aesthetics; Re-forestation — aesthetics; Utilities; Interpretation — aesthetics; Recreation — aesthetics; Special influence area.

Potter, Dale R., and J. Alan Wagar.

1971. Techniques for inventorying man made impacts in roadway environments. USDA For. Serv. Res. Pap. PNW-121, 12 p. Pac Northwest For. Exp. Stn., Seattle, Wash.

Abstract

"Four techniques for inventorying man made impacts along roadway corridors were devised and compared on the basis of type and quality of data obtained, types of maps produced, area covered, and relative cost and time requirements." No measures were made of degree of impact on scenic quality or preference. 11 refs.

Sargent, Frederic O.

1966. Ideas and attitudes — a scenery classification system. J. Soil and Water Conserv. 1966 (Jan.-Feb.):26-27.

Abstract

A scenery classification system based on the categories: "distance, interest, variety, special interest, and eyesores" is presented. "The system is designed to compare scenic resources within a planning region." Values from 0 to 5 are assigned to the distance, interest and variety factors according to specific criteria. Eyesores have negative values from 1 to 5, while special interests have positive values from 1 to 5, depending on the degree of time the factor "catches and holds the eye." The four factors are then summed to determine the total scenic value at each location evaluated. Additional comments at each site are also included. No refs.

Critical Comments

The procedure is arbitrary; values are assigned subjectively. The assumption of equal weights for the four factors is unvalidated; therefore, even the ordinal rankings may be questionable. While the procedure may differentiate distinctly different scenic areas, such extremes are identifiable without formal, mathematical models.

U.S. Department of Agriculture, Forest Service.

1972. Forest landscape management, Vol. 1. 137 p. U.S. Dep. Agric. For. Serv., North. Reg.

Abstract

A systematic and comprehensive analysis by landscape architects of the variables judged to contribute most to resource management decisions. Lists the pros and cons of alternative scenic treatments. 27 refs.

Critical Comments

A comprehensive coverage of the topic, beautifully illustrated. Pros and cons are not validated experimentally or otherwise.

Headings

Landscape management; Landscape management fundamentals; Seeing the visual resource (light, observer distance, observer position, sequence, landscape types, object analysis); Perceiving the visual resource; Applied landscape management; Topic areas (timber harvest, roads, structures).

U.S. Department of Agriculture, Forest Service.

1973. National forest landscape management, Vol. 1. USDA Handbook 434, 77 p. Wash., D.C.

Abstract

A training document used to illustrate the concepts, elements, and principles of a landscape management program which identifies physical characteristics of the landscape and analyzes the potential visual effects of management actions. 46 refs.

Critical Comments

An esthetically appealing document that may be considered a primer on the subject.

Headings

Characteristic landscape; Variety; Deviations from the characteristic landscapes; Dominance elements (form, line, color, texture); Dominance principles (contrast, sequence, axis, convergence, codominance, enframement); Variable factors (motion, light, atmospheric conditions, season, distance, observer position, scale, time); Landscape character analysis; Landscape management alternatives.

U.S. Department of Agriculture, Forest Service.

1974a. National forest landscape management, Vol. 2, ch. 1: the visual management system. USDA Handbook 462, 47 p. Washington, D.C.

Abstract

Application of the principles discussed in Vol. 1. Variety and sensitivity (based on number of viewers, duration of view, etc.) of scenic areas are analyzed and mapped for determination of management objectives. 3 refs.

Critical Comments

Though the premises are unvalidated, the mapping method is an impressive and possibly powerful planning tool. The volume is inviting, colorful, and easily followed. A useful glossary is provided.

Headings

Premises; Important terms (character type and subtype, characteristic landscape, distance zones, dominance elements, management activities); System process & scope; Variety classes (distinctive, common, minimal); Sensitivity levels (highest, average, lowest); Quality objectives (preservation, retention, partial retention, modification, maximum modification).

U.S. Department of Agriculture, Forest Service.

1974b. Recreation opportunity inventory and evaluation. USDA For. Serv. Res. Pap. R-1 74 006, 76 p. Washington, D.C.

Abstract

Proposes a system for rating "attractive" features of recreation areas (high, medium, low), visual resource characteristics (somewhat arbitrary numerical ratings, from -12 to +24), and "discord" elements such as pollution (5 levels from "none" to "severe"). Accessibility, capacity, and recreation opportunity variables are also considered. 14 refs.

Critical Comments

The authors state that this paper "focuses first upon people's preference," yet people are not asked for their preferences. Rather, this is a professional judgment inventory and is too complex for public use.

U.S. Department of Agriculture, Forest Service.

[n.d.] Quantitative analysis of the visual resource. 48 p. U.S. Dep. Agric. For. Serv., Landscape Archit. Branch, Div. Rec. and Lands, North. Reg.

Abstract

Employs a wide variety of analysis resources (e.g., maps, photos, inventories, etc.) to generate numbers representing the visual "appeal" of scenic areas. Underlying assumptions include: "... variety and uniqueness in objects are the overriding factors that create visual interest; variety in the visual resource can be assessed by counting the number of feature objects, the number of artificial objects, subtracting the latter from the former in recognition of their competitive relationship." No refs.

Critical Comments

Model is somewhat arbitrary. For example, the procedure assumes consistently negative values for "artificial" objects.

U.S. Department of Agriculture, Forest Service and Tahoe Regional Planning Agency.

1971. Scenic analysis of the Lake Tahoe region: A guide to planning. 37 p. Tahoe Plann. Agency, South Lake Tahoe, Calif.

Abstract

Contains three studies concerned with scenic beauty of the Tahoe Region: "Visual Pollution in the Lake Tahoe Basin" (McEvoy III and Williams), "Visual Landscape Units of the Lake Tahoe Region" (Litton and Shiozawa) and "Scenic Analysis of Principal Travel Routes in the Lake Tahoe Region" (Hagemeier, Ostergaard, Noble, and Kirschenmann). All are inventories and/or descriptions of various natural and man made features of the region. No refs.

Vedenin, Y. A., and N. N. Miroschenichenko.

1970. Evaluation of the natural environment for recreational purposes. *Ekistics* 31:223-226.

Abstract

"The purpose of the present paper is to suggest a method of grading areas from the point of view of the organization of large regions for prolonged recreation." Physical factors are analyzed and areas mapped for recreation preference. 6 refs.

Critical Comments

The approach is based upon physical factors only. Public evaluations are not included.

Walker and Havens Landscape Architects.

1973. An evaluation of the aesthetic values as related to the water resources of the Columbia-North Pacific Region. 93 p. Walker and Havens Landscape Archit., Eugene, Oreg.

Abstract

"The purpose of this study is to identify within selected river basins those areas of higher aesthetic value with respect to human experience. In addition, the report shows those areas with lower aesthetic value which may be modified without great loss of landscape amenity." A detailed inventory of the physical features of the region was used to derive numerical esthetic ratings which were mapped. Research on public esthetic evaluations is recommended. 34 refs.

Critical Comments

Beautiful publication with much detail concerning the physical characteristics of the region. Conclusions are based on subjective professional judgments.

Zube, Ervin H.

1970. Evaluating the visual and cultural landscape. *J. Soil and Water Conserv.* 25(4):137-141.

Abstract

This paper reviews the approach of the North Atlantic Regional Water Resources (NAR) study in evaluating the visual and cultural landscape of a large area on the Atlantic seaboard and how the interfacing of water and other development needs can be accommodated. To evaluate the landscapes, landscape inventory and landscape evaluation techniques were established. The landscape inventory technique is a hierarchical classification (landscape series, landscape systems, and landscape units). Also considered in rating the landscape are significant historic sites, state parks, and forests or other areas of unique vegetation or scenic value."

To interface the visual and cultural landscape concerns with 17 water-related needs in the planning study, seven broad sub-needs of visual and cultural landscape components were identified. These provide a guide for evaluating tradeoffs among the water management plans considered under alternative development strategies. 1 ref.

Critical Comments

"The more dominant the form, the less important the pattern" is the assumption used for weighting, as well as greater value means higher value. Validation is needed. Good in that it considers both economic and visual values in water management.

PUBLIC INVOLVEMENT

As noted throughout Section II, public perceptions of scenic beauty may provide useful information to managers of public lands. This section includes articles that have worked from this premise, employing techniques such as questionnaires, interviews, semantic differentials, bidding games, psychophysical methods, etc.

Acking, Carl Axel, and Gunner Jarle Sorte.

1973. How do we verbalize what we see? *Landscape Archit.* 64:470-475.

Abstract

Three experiments are reported which concern "the individual's experience of landscape" and the associated descriptive

elements. In the first experiment, 40 subjects judged 15 environments (presented as color slides) on seven-point semantic scales. Individuals were to assume they would stay in each of the environments for a 5-year period. Factor analysis indicated that the landscapes would affect the individuals by causing them to (1) feel more calm or aggressive, and (2) more silent or extroverted. The second experiment showed that landscape complexity received low values in pleasantness. In the third experiment, subjects identified objects that did not fit into the environment (non-unity) and listed their reasons. Results indicate that, in general, "unity is reduced if the elements are of permanent character, whereas complexity is increased when the intruding elements have a temporary character." 7 refs.

Critical Comments

The adjectives used in the semantic scales are somewhat nebulous and could be defined in many ways by the nonprofessional subjects.

Appleyard, Donald, and Mark Lintell.

1972. The environmental quality of city streets: The resident's viewpoint. *J. Am. Inst. of Plann.* XXXVIII:84-101.

Abstract

"Field interviews and observations were carried out on three similar San Francisco streets with differing traffic levels to determine how traffic conditions affected the livability and quality of the street environment. All aspects of perceived livability — absence of noise, stress, and pollution; levels of social interaction, territorial extent, and environmental awareness; and safety — were found to correlate inversely with traffic intensity. Traffic increases were also accompanied by the departure of families with children from these streets. Responses were nevertheless muted for a number of probable reasons, including environmental self-selection, adaptation, and lack of a target for resentment. The study is presently being replicated on a larger scale. Meanwhile, interim policies and standards are proposed." 21 refs.

Appleyard, Donald, Kevin Lynch, and John R. Meyer.

1964. The view from the road. 64 p. MIT Press, Cambridge, Mass.

Abstract

"Deriving its basic philosophy from the *Image of the City* (Lynch 1960), this book attempts to systematically record visual experiences while driving along the highway. Valuable primarily for some of its fresh approaches in methodology, *View from the Road* is designed as an experiment" (Harrison 1974).

Appleyard, Donald, Kevin Lynch, and John R. Meyer.

1967. The view from the road. In *Environmental perception and behavior*. p. 75-88. David Lowenthal, ed. Univ. Chic., Dep. Geogr., Res. Pap. 109. Chic., Ill.

Abstract

Presents general conclusions based on expressway travel studies in New York, Hartford, Boston, and Philadelphia. A multimedia procedure (tapes, films, photos, sketches) was employed to record the perceptual environment of the driver and passengers along the expressway routes. Analysis of the results led to the development of a graphic language reflecting the subject's perception and the incorporation of the graphic language into the basic design of two hypothetical expressways. A comprehensive summary of drivers' experiences along the expressways is reported with recommendations to make the "view from the road" a safe, educational, and esthetically pleasing experience. 1 ref.

Critical Comments

The method used to measure public preferences is not provided, only mentioned. Discussion appears to be based primarily on the researchers' intuitive analysis of the "View from the Road."

Boster, Ron S.

1973. On the criteria for and possibility of quantifying the esthetic aspects of water resource projects. *In* Toward a technique for quantifying of water resources. p. 6-12. Perry J. Brown, ed. PRWG-120-2, Utah State Univ., Logan.

Abstract

Twelve criteria are presented for consideration in evaluating esthetic quantification studies. The criteria are: (1) conducive to public involvement, (2) independent of the tastes and preferences of the developers of the technique, and statistically and mathematically unbiased, (3) theoretically sound, (4) separates the role of actual landscape features from the effects of observer standards including response bias, (5) adequately handles uncertainty of judgments, (6) cardinal or interval outputs, (7) easy to use, (8) relatively inexpensive, (9) meaningful, useable outputs, (10) regional applicability, (11) valid, (12) reliable. Applications of the Theory of Signal Detection to scenic preferences of wildland areas managed or treated in different ways is reported and evaluated against the 12 criteria. 13 refs.

Boster, Ron S. and Terry C. Daniel.

1972. Measuring public responses to vegetative management. Proc. 16 Annu. Watershed Symp., Rep. No. 2, p. 38-43.

Abstract

Presents a set of criteria "that might be used to judge techniques designed to quantify scenic beauty" and describes a new approach to scenic assessment, based on a "systematic conceptual model" of perception. The new approach, derived from the Theory of Signal Detection, produces cardinal indices of public perceptions of scenic beauty. The method employs color slide presentation and 10-point scenic beauty rating scales. It is easy to use and provides unbiased and meaningful indices of scenic beauty. 9 refs.

Brown, Perry J., ed.

1973a. Toward a technique for quantifying aesthetic quality of water resources. PRWG-120-2. 91 p. Utah State Univ., Logan, Utah.

Abstract

It is possible to quantify esthetic quality as it relates to water resources. Eleven criteria are suggested for providing a valid and operable quantification scheme. Concerns of colloquium members and directions for future research are suggested. Presentations by the colloquium members are included. 7 papers, 56 total refs.

Critical Comments

Papers presented in the volume represent some innovative thinking. See annotations of the papers (all 1973) by Boster, Brown, Cherem, Fuhrman, Gum et al., and Newby.

Brown, Perry.

1973b. Understanding scenes: Evaluation technique. *In* Toward a technique for quantifying aesthetic quality of water resources. p. 65-75. Perry J. Brown, ed. PRWG-120-2, Utah State Univ., Logan.

Abstract

Psychological research indicates that some or all of the following conditions are present when something is esthetically pleasing: (1) orderliness of the arrangements of elements in a scene, (2) stimulus complexity and/or psychological complexity, (3) the right amount of information (sic), (4) past learning experiences. Photographic procedures (by Shafer et al.) to evaluate esthetic appeal are reviewed. Validating photographic-esthetic evaluation procedures with on-site visitation is recommended. A generalized esthetic quality rating procedure is described, but has not been tested. 16 refs.

Bultena, Gordon L., and John C. Hendee.

1972. Foresters' views of interest group positions on forest policy. J. For.:337-342.

Abstract

"Foresters on five National Forests in the Pacific Northwest, when identifying special interest group positions on timber cutting, aligned themselves with commercial (as opposed to) recreational-aesthetic interest, viewing the latter as having unjustified expectations. On the issue of opening trails to motor bikes, foresters saw a split among recreational interests." A questionnaire method was employed.

Critical Comments

Questionnaires were given only to professional foresters, so results reveal foresters' perceptions of interest group positions. 25 refs.

Calvin, J. S., J. A. Dearing, and M. E. Curtin.

1972. An attempt at assessing preferences for natural landscapes. Environ. and Behav. 4:447-470.

Abstract

Observers were asked to judge 15 different views of natural scenery on each of 21 semantic scales. Factor analysis identified two factors which people use in their subjective assessments of natural scenery: scenic beauty and natural force-tranquility. Shafer et al. (1969, see p. 22) elements were included in a later factor analysis. 23 refs.

Carr, Stephen, and Dale Schissler.

1969. The city as a trip — perceptual selection and memory in the view from the road. Environ. and Behav. 1:7-35.

Abstract

This study attempted to measure how people perceive and remember their approach on an elevated expressway to the center of a city. Psychological studies are reviewed which relate eye movement and eye fixation to elements of the environment. Hypotheses of perceptual selection were proposed. Subjects (N=49), front seat passengers with headmounted eye movement recorders, were tested on the Northeast Expressway into Boston. Commuters and drivers without recorders were also tested. Statistical analysis of eye movements and memory tests strongly support the hypothesis that the form of the expressway actually structures the way in which people scan their surroundings and largely determines the elements they select for close attention. Common factors that caused visual selection of objects on the Northeast Expressway were identified and used by two judges to predict elements that travelers would focus on when using the Southeast Expressway. Field tests supported the judges' predictions based on the hypothesis that "major items that subjects will remember after an automobile trip into the city can be predicted primarily on the basis of the amount of time an item is in view." 25 refs.

Cherem, Gabriel.

1973. Looking through the eyes of the public or public images as social indicators of aesthetic opportunity. In *Toward a technique for quantifying aesthetic quality of water resources*. p. 52-64. Perry J. Brown, ed. PRWG-120-2. Utah State Univ., Logan.

Abstract

Kevin Lynch's (1960) concept of public images is investigated through "user employed photography" in a 700-acre wildlife sanctuary. Subjects (N=225) were given a 12-shot Kodak X-25 camera and a comment sheet and were asked to photograph any scene or object they wished while hiking along a chosen path and to record their reasons for taking each picture. Analysis of results suggested "change" as the explanation for scenes or objects consistently photographed. A twelve dimension "bipolar senso-environmental change rating scale" (equal weights for all dimensions) is developed to measure changes from one area to another. A public preference unit rating scale is suggested for evaluating areas where man made changes are anticipated to determine if the changes will increase or decrease esthetic quality. 2 refs.

Critical Comments

A very innovative study. The assumption that, "all dimensions of change are assumed to be equipotent in their effect on image strength," needs to be validated.

Clark, Roger N., George H. Stankey, and John C. Hendee.

1974. An introduction to Codinvolve: A system for analyzing, storing, and retrieving public input to resource decisions. USDA For. Serv. Res. Note PNW-223, 16 p. Pac. Northwest For. and Range Exp. Stn., Seattle, Wash.

Abstract

"Codinvolve is a flexible, content-analysis system specifically designed for objective analysis of public input — coding, storing, retrieving, summarizing, and displaying that input as it is needed. Codinvolve is based on a coding process which provides quantitative summaries of all opinions — and qualitative descriptions of supporting reasons. . . The concepts and criteria on which the system was based are discussed. General procedures for applying Codinvolve are explained." 4 refs.

Critical Comments

The authors admit that "coding is a demanding job, and not everyone can do it." Codinvolve depends on subjective interpretations of verbal communications; there may be a tendency (albeit unintentional) to treat results as more objective and systematic than they really are.

Cook, Walter L., Jr.

1972. An evaluation of the aesthetic quality of forest trees. *J. Leisure Res.* 4(3):293-302.

Abstract

"Twelve pairs of mature forest trees representing three classes of timber quality were selected along trails at three recreation sites in New York and Pennsylvania. A different hardwood species was selected at each site. Visitors compared the attractiveness of the trees within each pair, indicating their preference, and selected from a list those physical characteristics most responsible for their choice. The results indicated a positive relationship between esthetic quality and timber quality, especially in pairs representing very good and very bad timber quality. The relationship was somewhat erratic, however, indicating that timber quality classifications were not sufficiently discriminating, and did not encom-

pass all the criteria of esthetic quality. Characteristics most often marked as reasons for preference were: more balanced, more attractive background, straighter, and more branches." "Picturesque" trees are often appreciated on an esthetic dimension in spite of disease. A categorical assumption that a healthy tree is a beautiful tree is dubious. 4 refs.

Critical Comments

Comparative forced choice procedure leads to unbiased data, but presents some difficulty if more than a few sites (or trees) are to be compared and/or a large number of subjects are to be tested.

Costantiri, E., and K. Hanf.

1972. Environmental concern and Lake Tahoe: A study of elite perceptions, backgrounds, and attitudes. *Environ. and Behav.* 4:209-242.

Abstract

Presents an analysis of interviews with 303 persons "who, by virtue of their activity, position, and reputation, were identified as having a significant impact on environmental decision-making in the Lake Tahoe Basin." The study utilized both structured and unstructured questions, as well as a questionnaire consisting of 84 4-point Likert-type statements ("strongly agree" to "strongly disagree") concerning environmental perceptions, attitudes, and solutions. Face validity assessment and "item analysis" were used to limit the list of Likert scales. Responses to 6 Likert items were then used to classify respondents as "high," "middle," or "low" in environmental concern. These three groups are contrasted in terms of their responses to the interviews. 12 refs.

Critical Comments

Likert scales included no neutral or undecided category.

Coughlin, Robert E., and Karen Goldstein.

1970. The extent of agreement among observers on environmental attractiveness. *Reg. Sci. Res. Inst. Discuss. Pap.* Number 37, 56 p. Reg. Sci. Res. Inst., Phila., Pa.

Abstract

Judges were asked to rate environments on a scale from 1-7. Four groups rated photographs of watersheds, while one group rated scenes in the field. "Statistical tests revealed that judges are able to discriminate among environments on the basis of their attractiveness and tend to have a relatively high level of agreement on a given environment. . . The lowest levels of agreement were found when the judges were asked to rate slides with regard to functional attractiveness for living-in and for sightseeing, rather than for environmental attractiveness in the abstract. . ." Responses to slides tended to be consistent with responses to the same environments in the field. A relative preference for "natural" over "suburban" environments was noted. No refs.

Critical Comments

Provides validation for use of photographic representations of environments, for assumption that "natural" environments are preferred, and for procedures involving the public.

Coughlin, Robert E., Thomas R. Hammer, Thomas G. Dickert, and Sallie Sheldon.

1972. Perception and use of streams in suburban areas: Effects of water quality and of distance from residence to stream. *Reg. Sci. Res. Inst. Discuss. Pap. Ser.*, Number 53, 73 p. Reg. Sci. Res. Inst., Phila., Pa.

Abstract

Onsite interviews, mail questionnaires, and chemical measurements of stream water quality were used to derive a statistical relationship between water quality and perception and use of streams. Results of regression analyses indicate that the less polluted a stream appears, the more it is liked and used. Dependent variables were derived from the questionnaire; independent variables included distance to stream, number of children, drainage area, a water quality index, and 16 chemical indicators.

Critical Comments

Interesting combination of survey results and physical measurements.

Craighead, Frank C., and John J. Craighead.

1962. River systems: Recreational classification, inventory, and evaluation. *Naturalist* 13(2):3-19.

Abstract

The authors propose a classification, evaluation, and rating system emphasizing "the qualitative aspect of the water resource and its esthetic role." Sample questionnaires evaluating boating, fishing and hunting resources are provided. Each questionnaire contains 12-13 criteria which can be used to rate a stream or watershed. 6 refs.

Critical Comments

Assignment of numerical ratings to descriptive criteria is arbitrary or subjective. Authors do not indicate whether professionals or non-professionals should do the evaluating.

Headings

Recreational classification; Size; Condition and use; Ecological sub-classes; Inventorying resources and evaluating quality; Quality evaluation; Rating criteria; Quality designation; Discussion of rating criteria for determining quality; Environmental effect; Populations; Success or satisfaction; Accessibility; Crowding; Research and management; Season; Conflicts; Size; Habitat; Pollution and littering; Hazards and barriers.

Craik, Kenneth H.

1968. The comprehension of the everyday physical environment. *J. Amer. Inst. Plann.* 34:29-37.

Abstract

Describes a model for studying environmental perception. Identifies important observer groups, various methods of presenting environmental displays, 14 possible judgment formats, and several validation criteria. 33 refs.

Critical Comments

Is especially useful for obtaining references on the possible judgment formats that can be used in evaluating environments and for viewing the range of possible observers and presentation modes.

Headings

Appraisal of inter-observer objectivity; Constructing landscape rating scales; Selecting a test set of diverse landscape scenes; Constituting panels of observers; Procedure; Appraisal of the reliability of the landscape rating scales and graphic landscape topology. The relationship of landscape dimensions and types to aesthetic appeal. Development and application of the landscape adjective check list.

Craik, Kenneth H.

1970. A system of landscape dimensions: Appraisal of its objectivity and illustration of its scientific application. Rep. to Resour. for the Future, Inc. 58 p. Inst. Pers. Assess. and Res., Univ. of Calif., Berkeley.

Abstract

Utilizes the landscape rating scale developed by Litton (1968) to identify the constituent elements present in slides representing 50 varied landscapes with minimal "signs of human activity or artifacts." In addition, a graphic "Landscape Typology" of 10 primary landscape types was used by reviewers in evaluating the 50 slides. Analysis showed that the landscape rating scale and the graphic landscape typology criteria are independent of the reviewing group. The slides were then categorized according to landscape dimensions in terms of how esthetically "pleasing" each slide was. A landscape adjective check list is developed, based on a sample of six slides. 23 refs.

Critical Comments

Numerous statistical tests are applied to a single set of data. A priori typological factors are found to be only *marginally* related to observer preferences, thus the validity of the system for use in the management of public lands is questionable.

Paper is very similar to 1972 paper: "Appraising objectivity of landscape dimensions." In *National environments: studies in theoretical and applied analysis*. p. 292-346. John V. Krutilla, ed. Johns Hopkins Univ. Press, Baltimore, Md.

Craik, Kenneth H.

1975. Individual variations in landscape descriptions. In *Landscape assessment: Values, perceptions, and resources*. p. 130-150. E. Zube, J. Fabos, and R. Brush, eds. Dowden, Hutchinson and Ross, Stroudsburg, Pa.

Abstract

Professionals and nonprofessionals were given "tours" through an area of Marin County, California by auto, by color film of an auto tour, by simulated tour of a scale model of the area, or by viewing a black and white video tape of the simulated scale model tour. Subsequently, they were asked to describe the tour using a "landscape adjective check list" and to describe themselves on a number of standard personality and attitude measures. Only the results of the auto tour observers are discussed.

Factor analysis revealed four factors accounting for 65 percent of the commonality. Sixteen groups of respondents ("O-types") responding differentially to the four factors were identified. Personality and environmental perception were related. 19 refs.

Critical Comments

This is an interesting study which carries management implications. Results suggest, for example, that some people tend to communicate their perceptions to the proper agencies, but these people comprise an O-type with one of the lowest memberships and with perceptions substantially different from those of other O-types.

Daniel, Terry C., and Ron S. Boster.

1976. Measuring landscape esthetics: The scenic beauty estimation method. USDA For. Serv. Res. Pap. RM- 167, 66 p. Rocky Mt. For. and Range Exp. Stn., Ft. Collins, Colo.

Abstract

"The Scenic Beauty Estimation Method (SBE) provides quantitative measures of esthetic preferences for alternative wildland management systems. Extensive experimentation and testing

is reported along with applications employing user, interest, and professional groups. SBE shows promise as an efficient and objective means for better assessing the scenic beauty of public forests and wildlands and also for predicting the esthetic consequences of alternative land uses. Extensions and modifications of the basic methodology offer potentially useful design, planning, and management tools." 41 refs.

Daniel, Terry C., Lawrence Wheeler, Ron S. Boster, and Paul R. Best, Jr.

1973. Quantitative evaluation of landscapes: An application of signal detection analysis to forest management alternatives. *Man-Environ. Syst.* 3(5):330-344.

Abstract

Presents a scenic beauty measurement technique based on the Theory of Signal Detectability (TSD), a psychophysical measurement model that distinguishes between observer sensitivity and criterion state. Two questions are addressed: (1) can observers discriminate reliably among various vegetative treatments, and (2) do observers make differential esthetic responses to the various treatments? The method is applied to evaluation of Northern Arizona ponderosa pine forests. Color slides of the study areas were rated on 10-point scenic beauty rating scales and analyzed using the TSD technique. The slide presentation technique was validated by onsite judgments. 21 refs.

Dunn, Michael C.

1973. Scenic routes and recreation planning: The Teme Valley experiment. *Res. Memo. Number 27*, 38 p. Univ. of Birm., Eng.

Abstract

Describes an experiment carried out in the summer of 1973 by the West Midlands Tourist Board to set up and evaluate the use of a scenic drive. Presents the analysis of a questionnaire survey of a small sample of users and discusses the policy implications of the experiment.

Fabos, Julius Gyula.

1973. Model for landscape resource assessment. *Mass. Agric. Exp. Stn. Res. Bull. Number 602*, 141 p. Coll. Food and Nat. Resour., Univ. Mass., Amherst.

Abstract

This model makes use of both public attitude surveys and extensive physical inventories of ground and surface water quality and supply, wildlife productivity, agricultural productivity, visual and use complexity and compatibility, and tree cover. The public survey consisted of numerous Likert scales (strongly agree to strongly disagree) and ranking of the values of eight general resource variables. Public values are translated into coefficients (0, .2, .4, .6, .8, 1.0) designed to modify inventory values. Public attitude coefficients were not used in the pilot study as they did "not exert an important influence on composite resource value" in this instance. All coefficients exceeded .8. 137 refs.

Critical Comments

Many Likert items are rather difficult to understand. This probably did not present problems for the many professional respondents, but may have been an obstacle for other respondents and may help explain low response rates (from 12 to 30 percent for many subsamples). Ranking items were very general and difficult to conceptualize and compare. The lack of discrimination among public attitude coefficients suggests a need to force respondents into tradeoff decisions where tradeoffs are necessary in the real world.

Headings

The state of metropolitization; Guidelines (principles) for landscape planning and landscape resource assessment models; Sub-models for the measuring and rating of the values of landscape resource variables; Application of the initial model to the study area.

Fowler, Ronald L., and Richard L. Bury.

1973. Visitor evaluations of a developed outdoor recreation area on a national wildlife refuge. *In Human dimensions in wildlife programs*. p. 50-56. John C. Hendee and Clay Schoenfeld, eds. Mercury Press, Rockville, Md.

Abstract

This study represents an attempt to determine the attitudes, characteristics, and satisfaction levels of visitors to a wildlife refuge in Georgia. Nine semantic scales and 25 modified Likert rating scales were employed. Factor analysis and analysis of variance revealed that visitors feel commercialism is inappropriate on game reserves. However, "there is no such thing as an average visitor. . . various groups perceive the refuge differently; consequently, the visitor could be provided a choice of several alternative experiences." 10 refs.

Gauger, Stephen E., and J. B. Wyckoff.

1973. Aesthetic preferences for water resource projects: An application of Q methodology. *Water Resour. Bull.* 9(3): 522-528.

Abstract

This study was designed to investigate whether esthetic preferences related to water projects could be determined, and whether they differ among different groups of people. A "Q sort" of 44 photographs of a wide variety of water development projects was conducted with two groups, photographers ("esthetic man") and town assessors ("economic man"). The resultant analysis identified two significant factors. Factor 1 provided insight into a hypothesis of nature-dominant or man-dominant scenes. Factor 2 indicated that the respondents had a negative preference for projects which were in varying stages of completion or appeared to be polluted. Preferences were consistent between the two groups tested. The test revealed that people do not necessarily equate only naturalness with esthetic appeal, but will accept development as esthetic, provided that it is designed to complement the natural landscape. 7 refs.

Gould, Peter.

1966. On mental maps. *Mich. Inter-Univ. Community Math. Geogr. Discuss. Pap. Number 9*, 54 p. Univ. of Mich., Ann Arbor.

Abstract

Students ranked states in order of their preferences for residential living. Results are presented by an iso-preference map. No refs.

Critical Comments

Mapping technique has potential by illustrating scenic preferences.

Gratzer, Miklos A., and Robert D. McDowell.

1971. Adaptation of an eye movement recorder to esthetic environmental mensuration. *Storrs Agric. Exp. Stn., Res. Rep. Number 36*. 29 p. Coll. Agric. and Nat. Resour., Univ. of Conn., Storrs.

Abstract

Reports on a new apparatus for the recording of human eye movements of subjects scanning landscape photographs. The results indicate that the method is suitable for mass use, requires no clinical facilities or ocular anesthesia and is fast and accurate. Most fixation points seem to accrue along "edges" and on small objects. Although there appears to be no universal scanning pattern, individuals are consistent in their own scanning pattern. 9 refs.

Critical Comments

Results are consistent with other studies which argue that contrast, variety, complexity, etc. are important esthetic dimensions. This is an innovative experimental method for identifying important landscape components, but the equipment may be too expensive for many research budgets.

Gum, Russell, Robert Judge, Dan Kimball, and Weston Wilson.
1973. Quantifying aesthetic quality of water resources. In *Toward a technique for quantifying aesthetics of water resources*. p. 32-51. Perry J. Brown, ed. PRWG-120-2. Utah State Univ., Logan.

Abstract

A research procedure "based upon a lexicographic analysis of people's perceptions of the components of aesthetic opportunity in combination with a modified Delphi process" is reported. Several methods (Thurston paired comparison test, Comrey paired allocation test, a rank order test, a simple average rating test, and a rating test based on the Theory of Signal Detection) are compared in establishing a weighting system for the esthetics of air (visibility, odor, irritants), water (clarity, floaters, odors), landscape (urban, mountain, desert, agriculture, forest, water dominated), biota (population, variety, healthy, location), and sound (background and intermittent). A Cobb-Douglas preference function is suggested for each esthetic category, e.g., air, water, etc., as a mathematical model to determine the elasticities of the subgoals, thereby establishing a tradeoff hierarchy. Esthetic preferences can be presented on three levels: (1) "average" or representative preference functions, (2) individual preference functions, and (3) grouped preference functions representing a "stereotype" of individuals with similar preference functions. Grouped preference functions (based on cluster analysis) are recommended as the most useful preference functions to incorporate into overall planning strategies. 12 refs.

Critical Comments

An interesting and fairly comprehensive investigation. The use of the Cobb-Douglas equation (commonly used by economists) is innovative; however, its effectiveness for this application is not validated.

Hampe, Gary D., Verne E. Smith, and James P. Mitchell.
1974. Water-related aesthetic preferences of Wyoming residents. *Water Resour. Res. Inst.*, Ser. Number 46, 111 p. *Water Resour. Res. Inst.*, Laramie, Wyo.

Abstract

"The water-related aesthetic values of 237 individuals are analyzed. This study is one of the first to use color photographs on a general population. Important differences were found by age and educational level." Scenes are classified into 8 types, depending on the type of water, mountains, man made objects, or people in the scenes. Respondents were asked first to rank their preferences for scenes within each type, then to rank the scenes between types. Multiple t's and stepwise regressions were used to analyze the data. 16 refs.

Critical Comments

Multiple t's present the problem of alpha slippage. Other analyses would have been more appropriate for multiple comparisons (e.g., ANOVA with post hoc testing).

Hancock, H. K.
1973. Recreation preference: Its relation to user behavior. *J. For.* 71(6):336-337.

Abstract

A questionnaire was used to determine how well campers' opinions about campsite vegetation agree with the behavior and opinions of subsequent campers selecting the same campsites with less vegetation. The study involves "campsite choices of 280 transient camping parties. . ." in the Cache National Forest, Utah. In general, decreased vegetation increased the selection of a campsite until a minimum threshold (virtually no vegetation) was attained—a finding contrary to opinions expressed by previously surveyed campers that the existing level of vegetation was optimum, and that a lower level would be less desirable. 4 refs.

Critical Comments

The study seemed tightly controlled. The surprising results may point to inherent problems with nonbehavioral models such as questionnaires (as employed in this study) and simple expressions of preference. Another possible explanation may be that preference may not be a good predictor of use; factors other than aesthetics (or, in this case, vegetation) may control site selection for recreation use.

Heberlein, Thomas A.
1973. Social psychological assumptions of user attitude surveys: The case of the wilderness scale. *J. Leisure Res.* 5(3):18-33.

Abstract

"Surveys of user attitudes often neither help managers meet user needs nor preserve recreational resources because these studies have little grounding in attitude theory.

Three issues in attitude theory are discussed and their relevance for user attitude surveys illustrated with examples from the wilderness scale developed by Hendee and associates (1968).

The organization of attitudes—vertical and horizontal structures and their centrality to the actor—is as important as individual preferences. It is unlikely that knowledge of user attitudes can help the manager either predict or change user behavior since the bulk of empirical material studies suggest there is no clear linear relationship between single attitudes and behavior.

Evidence is presented to show that the possibility of changing user attitudes is very low." 27 refs.

Critical Comments

Some recent studies have shown that attitude change, particularly concerning scenic resources, is possible.

Hendee, John C., and Robert W. Harris.
1970. Foresters' perception of wilderness-user attitudes and preferences. *J. For.* 68(12):759-762.

Abstract

A questionnaire completed by 1350 wilderness users and 56 forest managers identifies attitudes relating to "purity of their perspective" of wilderness, policy and management alternatives, and expected behavior and customs. Results indicate that the perceptions of forest managers about wilderness users' attitudes are accurate in many viewpoints but inaccurate in others.

This observation points to the need for more frequent and extensive sampling of wilderness users' attitudes. 15 refs.

Hendee, John C., William R. Catton, Jr., Larry D. Marlow and C. Frank Brockman.

1968. Wilderness users in the Pacific Northwest—their characteristics, values, and management preferences. USDA For. Serv. Res. Pap. PNW-61, 92 p. Pac. Northwest For. and Range Exp. Stn., Seattle, Wash.

Abstract

This comprehensive study of wilderness users is based on the responses of 1350 persons to a questionnaire. One finding suggests some of the behaviors respondents sanctioned are inconsistent with sustaining the high quality of the wilderness resources. Public education may be needed. 44 refs.

Headings

The need for insight into wilderness users' tastes and preferences; Wilderness management not a majority vote problem; Visitors to three areas were studied; Questionnaires—the basic research tool; Demographic characteristics of wilderness users; Differentiating wilderness users by their attitudes; Other research classifying wilderness users; Wilderness-user behavior and attitudes toward management policies; Management preferences for wilderness-type areas; Management preferences summarized.

Hendrickson, P. O., R. W. Bahl, B. A. Gray, and W. S. Maynard.

1974. Measuring the social attitudes and aesthetic and economic considerations which influence transmission line routing. 121 p. Battelle Pac. Northwest Lab., Richland, Wash.

Abstract

“. . .described three slightly different approaches to evaluate visual quality of a view using a questionnaire on which the individual quality indicators of intactness (apparent degree of natural condition), vividness (memorability of the visual impression received from an image), and unity (compositional integrity, harmony and coherence) were separately rated for the 'before' and 'after' photos. A rating was also given to the visual importance of each element in the view. . .two scores were then placed into a ratio to express the severity of the change in visual quality relative to the 'before' quality score. 'Visual impact' was then expressed as a product of the ratio of change in visual quality and the size of the viewing population." The procedure takes into account the frequency of viewer contacts with a particular scene.

The authors recommend appraisal by a panel of five, four of whom are representatives of the "general public." 101 refs.

Critical Comments

The purpose is to measure change in landscapes due to introduction of transmission facilities, but the method does not distinguish between positive and negative changes. With larger samples, standardization, and inclusion of positive changes, this could be a very informative technique. Use of photos makes this questionnaire more reliable than most. Esthetic evaluation is but one section of the paper.

Headings

Review of the state of the art of transmission line routing; Measurement of social values; Quantification of aesthetic criteria; Measuring the social costs of transmission tower lines: A property value approach.

Kansas City, Missouri City Planning Department.

1967. Measuring the visual environment. Community Renewal Prog., Tech. Rep. 11, 80 p. City Plann. Dep., Kansas City, Mo.

Abstract

This is a pilot study for an inventory method that is designed to study entire cities. A survey was made of the "legibility" (colority, vividness, visual quality) of the cityscape of a small section of Kansas City. Trained observers examined the city by field reconnaissance and 37 citizens ("a balanced cross-section of the general population characteristics") were asked to give their impressions of certain areas by (a) sketching maps or diagrams, (b) listing distinctive elements, or (c) describing the location of particular city features. These surveys were followed by more intensive city reconnaissance and more public interviews. Results are synthesized into maps and recommendations for city improvements are made. No refs.

Kaplan, Rachel.

1973. Predictors of environmental preference: Designers and "clients." *In* Environmental design research. p. 254-264. W. F. E. Preiser, ed. Dowden, Hutchinson, and Ross, Stroudsburg, Pa.

Abstract

This study explored the relationship of "coherence" and "mystery" to preferences for slides of outdoor environments. Monochromatic slides, half graphic and half photographic, were rated on 5-point scales of preference, mystery (to what degree do you think you would learn more if you could walk deeper into the scene?), and coherence ("to what degree does it hang together?").

"Highly significant differences were obtained in the preference patterns of the three samples: Students in architecture, landscape architecture, and the College [U. of Michigan]." Architecture students rated urban environments higher and natural environments lower than the other two groups.

Graphic presentations were "difficult to understand" and thus excluded from the analyses. Mystery and coherence were found to be relatively independent and effective predictors of environmental preference. 12 refs.

Critical Comments

There is no indication that ratings were standardized, but partial *r*'s are calculated separately for each group.

Kaplan, Stephen.

1975. An informal model for the prediction of preference. *In* Landscape assessment: Values, perceptions, and resources. p. 92-101. E. H. Zube, J. G. Fabos, and R. O. Brush, eds. Dowden, Hutchinson, and Ross, Stroudsburg, Pa.

Abstract

Describes the process of identifying six variables which seem to have some role in the prediction of preference: complexity, mystery, coherence, identifiability, texture, spaciousness. Some evidence is empirical, some theoretical. See studies by R. Kaplan (1973), Kaplan et al. (1972), and Wohlwill (1968). 27 refs.

Kaplan, Stephen, Rachel Kaplan, and John S. Wendt.

1972. Rated preference and complexity for natural and urban visual material. *Percept. and Psychophys.* 12(4):354-356.

Abstract

Eighty-eight female subjects were shown 56 slides that represented a continuum of environments from "nature, to a predom-

inance of nature, to a predominance of man made aspects, to the urban scene." Using 5-point scales the subjects rated the randomly ordered slides on five factors, indicating their preferences for and the complexity of each slide. Rating results were used to classify the slides into four environmental domains and to summarize scenic preferences. Nonurban scenes were consistently preferred to urban scenes. Greater complexity within the natural and urban domains was preferred, but the role of complexity in determining preferences across domains was minimal. 13 refs.

Kooyoomjian, K. Jack, and Nicholas L. Clesceri.

1974. Perception of water quality by select respondent groupings in inland water-based recreation environments. *Water Resour. Bull.* 10(4):728-744.

Abstract

"This paper examines four lake environments which are paired by lake size and by trophic state, where trophic state is employed as an identifier of water quality. Two large lakes and two intermediate-sized lakes, with each pair having one oligotrophic lake and one eutrophic lake, are selected for cross-sectional survey-oriented questionnaire research. This paper focuses upon one aspect of the research, namely, the perception of water quality by three user groups. . . The groups are compared utilizing percentage response profiles and cluster level groupings. It appears from a preliminary analysis of the data that the lakes selected are viable trophic state endpoints for questionnaire analysis of respondents. Each user group surveyed does appear sensitive to select water quality parameters. . . Shifts in sensitivity appear within and between user groups with changes in ecological settings, as well as with factors independent of ecological settings." 13 refs.

Critical Comments

Incidence of returned questionnaires was very low (7-28 percent), making conclusions and generalizations questionable. The paper is somewhat easier to understand than the abstract (e.g., terms are defined early in the paper).

Leuschner, William A., and Roscoe B. Herrington.

1971. The skier: His characteristics and preferences. *In* *Recreat. Symp. Proc.*, p. 135-142. Northeast For. Exp. Stn., Upper Darby, Pa.

Abstract

Comparisons are made concerning skier characteristics and preferences from three regional surveys and a survey by a ski magazine. In general, "day skiers ranked proximity as the most important reason for skiing at a particular area. The physical quality of ski slopes (not including snow quality) was ranked second by the day skiers and first by skiers planning weekend and vacation trips." 5 refs.

Critical Comments

All data have previously been published elsewhere. This paper compares the regional characteristics. Basically, this is a confirmation of the apparent.

Lime, David W., and Charles T. Cushwa.

1969. Wildlife esthetics and auto campers in the Superior National Forest. USDA For. Serv. Pap. NC-32. 8 p. Northcent. For. Exp. Stn., St. Paul, Minn.

Abstract

"Many resource managers feel that a high percentage of excursions to forested areas are planned with the objective of

seeing wildlife in mind. However, a study of campers (open-ended questionnaire) in the Superior National Forest did not show wildlife to be a primary attraction to the area, although it was an important supplementary attraction." The questionnaire revealed much ignorance concerning wildlife. More information should be provided to campers. 8 refs.

Critical Comments

The procedure (open-ended questionnaire) may not have been sufficiently sensitive to determine the importance of wildlife. Eighty-nine percent of the respondents had previously visited the area and 90 percent saw wildlife during the trip in question. Ninety-six percent of these people indicated that wildlife added to the outdoor experience, suggesting that wildlife may be more than a "supplementary attraction."

Merriam, L. C., Jr., and R. B. Ammons.

1964-67. The wilderness user in three Montana areas: Bob Marshall Wilderness, Mission Mountains Primitive Area, Glacier National Park. 56 p. Sch. of For., Univ. of Minn., St. Paul.

Abstract

The attitudes of wilderness users and park visitors about the "characteristics of wilderness," what constitutes a wilderness experience, and what management policies should be followed were obtained through an open-ended questionnaire administered by direct interview. The study areas exhibit different levels of human development which were reflected in the various respondents' concepts of a wilderness experience. The need to manage different types of wilderness areas in different ways was made apparent through the variety of responses. Suggestions for further studies were included. 30 refs.

Critical Comments

The authors note the following weaknesses in their analysis: A. Small samples (the samples may not have been of sufficient size). B. Variations in the study that were not controlled: "1. Differences in individual interviewer techniques, 2. Interview times and locations, 3. Some people are talkative while others are not."

Milbrath, Lester W., and Robert C. Sahr.

1974. Perceptions of environmental quality. Pap., VIII World Congr. Int. Soc. Assoc., 39 p. [Toronto, Can., August 23, 1974].

Abstract

Interviews were used to obtain judgments of the environmental quality of natural physical environments, dwelling environments, activity environments, and community characteristics. Various elements within these classes were rated on polar adjective scales, e.g. pleasing to displeasing, absolutely essential to not important, dull to exciting. Ratings on the "pleasing-displeasing" scale were used as environmental quality indices.

Critical Comments

History of the development of the survey is very complete and informative. Inclusion of a rating category "inadequate information to judge" is a strong point; however, results would be easier to understand and use if respondents had been given considerably more information.

Headings

Conceptualizing the measurement problem; Definition of environment; Theoretical premises behind the operationalization; The instrument development process; Pilot study; Leaders pro-

jections about public beliefs; Validity and reliability; Constructing an index of environmental quality; The relationship of environmental quality to quality of life.

Moeller, George H., Robert MacLachlan, and Douglas A. Morrison.

1974. Measuring perception of elements in outdoor environments. USDA For. Serv. Res. Pap. NE-289, 9 p. Northeast For. Exp. Stn., Upper Darby, Pa.

Abstract

"The meanings of 10 general concepts that describe elements of natural outdoor environments and experiences were measured with the semantic differential technique. Each element or concept was evaluated in terms of semantic scores on three factors of meaning—evaluation, potency, and activity. A total of 180 recreationists were surveyed—60 from each of three recreation groups. Similarities and differences were found among the three groups—campers, picnickers, and wilderness hikers—in the way in which they perceived each other and elements of recreation environments. Although they are tentative, study results should contribute toward a better understanding of the way in which people relate to outdoor environments and what they expect from those environments." 11 refs.

Critical Comments

The authors admit that the elements being evaluated need to be defined more precisely. Respondents evaluated general terms such as National Forest, wilderness, state park, etc. This study is offered primarily as a demonstration of a methodology.

Morisawa, Marie.

1970. Evaluating riverscapes. In *Environmental geomorphology*. p. 91-106. Donald R. Coates, ed. First Annu. Geomorphol. Sym. Ser. Proc. [Binghamton, N.Y., Oct. 16-17, 1970].

Abstract

"Analyses of aesthetics are made in terms of spatial relationships, arrangements of lines and masses, light, color, and appeal to other senses. In this study two approaches are being used in aesthetics of riverscapes: (1) an 'expert's' evaluation of vista, color, vegetation, spaciousness, serenity, naturalness, riffles, turbidity and pollution, and (2) analysis of ratings by viewers of riverscape slides. Indications are that ratings of viewers and 'experts' are similar, that preferences are general, and that evidence of man's interference lowers the beauty value." 9 refs.

Critical Comments

Proposals are made to relate preferences to physical features in a manner similar to that of Daniel and Boster (1976).

O'Riordan, Timothy.

1971. Public opinion and environmental quality: A reappraisal. *Environ. and Behav.* 3(2):191-214.

Abstract

Presents a case study in which opinion polls were used to gather information on public perceptions of water quality. The effects of this and other types of public opinion inputs are discussed. 47 refs.

Critical Comments

Contains an extensive bibliography on public perceptions of pollution of various sorts.

Pendse, Dilip, and J. B. Wyckoff.

1974. A systematic evaluation of environmental perceptions, optimum preferences, and trade-off values in water resource analysis. WRRI-25, 86 p. Water Resour. Res. Inst., Oreg. State Univ., Corvallis, and Univ. of Mass., Amherst.

Abstract

"The specific study objective was to ascertain trade-off values for five environmental features: floods, water recreation, scenic view, wilderness, and a historical camping and recreation park. A simulated market experiment based on the PET (Priority Evaluation Technique) was the basic methodology applied. Five environmental variables (features) divided into three subsituations were depicted in black and white drawings highlighting environmental features and/or man-made features. Each situation was 'priced' and respondents indicated their satisfaction trade-offs under different budget (income) conditions. . . respondents valued removal of flood dangers above other considerations." Data were gathered via extensive interviewing. Procedure is an indirect approach to bidding. 46 refs.

Critical Comments

This is an interesting method for valuing scenic resources.

Peterson, George L.

1967. A model of preference: Quantitative analysis of the perception of the visual appearance of residential neighborhoods. *J. Reg. Sci.* 7(1):19-31.

Abstract

Visual appearances of residential neighborhoods were simulated by "a set of twenty-three color photographs. . . selected as representative from a quasirandom group of 100 taken in the northern half of the Chicago Metropolitan Area." Subjects (N = 140) rated the pictures on 10 dimensions: preference, greenery, open space, age, expensiveness, safety, privacy, beauty, closeness to nature, and quality of photography. Factor analysis and multiple regression techniques were used to combine common factors and determine their relationship to visual preference. Visual preference was found to be a function of four factors: harmony with nature (greenery, privacy, and open space), physical quality (age, expensiveness), "noise" (extraneous factors, undefinable in terms of the original ten factors) and quality of the photograph. 11 refs.

Critical Comments

Good, systematic development of a preference model.

Peterson, George L., and Edward S. Neumann.

1969. Modeling and predicting human response to the visual recreation environment. *J. Leisure Res.* 1(3):219-237.

Abstract

"A strategy is proposed for measuring and analyzing human preferences for the visual recreation environment. The aim is to develop quantitative preference functions which are sensitive both to individual differences and to visual characteristics of the environment. The strategy employs available measurement tools and statistical methods. . . Black and white photographs were used to elicit perceptions of and preferences for gross visual characteristics of a variety of beaches. Data acquisition proceeded in two stages, beginning with free responses to identify variables and culminating in the use of semantic differentials to measure selected attributes." Results identified two groups having distinctly different preferences. "One of the two groups prefers scenic natural beaches, is attracted by trees and natural growth, and finds crowding dis-

tasteful. The other group prefers city, swimming beaches, and is sensitive to the quality of the sand and attractiveness of surrounding buildings. It was determined, tentatively, that the two groups were using beaches for different purposes, and that the group which preferred scenic, natural beaches tended to be older and more educated." 9 refs.

Critical Comments

The evidence of more than one distinct subgroup is food for thought regarding generalized "public preferences." Only 8 photographs were employed.

Rabinowitz, C. B., and R. E. Coughlin.

1970. Analysis of landscape characteristics relevant to preference. Reg. Sci. Res. Inst. Discuss. Pap. Ser., Number 38. 88 p. Reg. Sci. Res. Inst., Phila., Pa.

Abstract

Attempts to identify specific objective characteristics of landscapes which are significantly related to preference ratings. Data on pollution, channel enlargement, and 183 site variables were gathered. Observers were then taken to the sites and asked for brief written descriptions and ratings of the sites on 29 different preference scales. A 17 x 23 descriptive matrix rating the characteristics of photographs of the areas was also developed.

Results indicate that people tend to agree more about what they like than about what they dislike. Preferred landscapes tended to be "park-like" or obviously man-influenced. Pattern and arrangement seemed to be important characteristics of preferred areas, while individual elements (primarily manmade, e.g., trash) were the focus of dislike. Although field observers and slide observers expressed the same scenic preferences, the important characteristics of those scenes differed between the groups. Preferences were highly correlated with attractiveness ratings. No refs.

Critical Comments

Authors note that preference for "park-like" landscapes may be influenced by the tendency for judges to think primarily in terms of recreation preference. It also may be an artifact of the particular landscapes employed.

Rabinowitz, C. B., and R. E. Coughlin.

1971. Some experiments in quantitative measurement of landscape quality. Reg. Sci. Res. Inst. Discuss. Pap. Ser. Number 43. 58 p. Reg. Sci. Res. Inst., Phila., Pa.

Abstract

The outcomes of several methods of evaluating scenic areas are compared: (1) housewives rated landscapes in the field using questionnaires, semantic differentials, and 14 rating scales (1-5). Six weeks later they rated slides of the same areas. (2) A community-action group rated slides of the same 14 stream sites used in experiment 1. (3) Housewives rated the slides in their homes.

Results showed substantial agreement among subjects and among experiments. However, landscape features that appear important on site differ somewhat from those identified in pictures. Different areas are preferred for esthetics than for use. No refs.

Critical Comments

May indicate a need to separate use-preference from esthetic-preference and to validate conclusions from slides by onsite comparisons. See related research by Rabinowitz and Coughlin (1970, p. 21) and Coughlin and Goldstein (1970, p. 14).

Randall, Alan, Berry Ives, and Clyde Eastman.

1974a. Bidding game for valuation of esthetic environmental improvements. J. Environ. Econ. & Manage. 1(3):132-149.

Abstract

An empirical case study of the benefits of abatement of esthetic environmental damage associated with the Four Corners power plant and Navajo mine using the bidding game technique is presented. Bidding games were carefully designed to avoid the potential problems inherent in that technique. The results indicate the existence of substantial benefits from abatement of this esthetic environmental damage. Aggregate bid curves, marginal bid curves, and estimates of the income elasticity of bid are presented. The effectiveness of the bidding game technique is discussed. 18 refs.

Critical Comments

Bidding game theory provides a promising approach to the difficult problem of scenic assessment and may find extensive use in the future. This article is a good introduction to bidding game procedures.

Randall, Allan, Berry C. Ives, and Clyde Eastman.

1974b. Benefits of abating esthetic environmental damage from the four corners power plant. Agric. Exp. Stn. Bull. 618, 40 p. N. M. State Univ., Las Cruces.

Abstract

This study was part of a larger, economic study concerning the Four Corners electric power-generation industry. Bidding game theory was used to derive. . . "monetary estimates of the benefits from abating the aesthetic environmental damage associated with the industry, as perceived by users of the affected environment." One conclusion was a confirmation of commonly held notion that environmental quality is a superior economic good.

Critical Comments

This is a well organized, well written report. Bidding game techniques are likely to play an increasing role in environmental evaluations and this paper provides a good introduction, by way of theory application to a relevant problem, to the procedures involved.

Rutherford, William, Jr., and Elwood L. Shafer, Jr.

1969. Selection cuts increased natural beauty in two Adirondack forest stands. J. For. 67(6):415-419.

Abstract

Five groups (Natural Beauty Conference members, College Forestry Club, high school biology teachers, college students, and silviculturists) were asked to evaluate 16 pairs of color slides by selecting the "most attractive" picture in each set. Each pairing included one slide which represented an undisturbed forest stand; the other represented a "stand that had been selectively cut 10 years ago." For softwoods, cut rather than uncut stands were preferred. However, for hardwoods cut and uncut stands were found equally attractive. 4 refs.

Critical Comments

The authors point out that what they measured was the relative attractiveness of paired slides—an ordinal measure of preference. They indicate the need to validate the study with actual field tests, and to extend the scenic preference procedure to all four seasons of the year. Photographers "composed" the slides used in this study, possibly introducing bias. Also, 17 percent of the responses were "undecided." These were excluded from the analysis, but there may be some valuable information therein.

Scherer, Ursula, and Robert E. Coughlin.

1971. The influence of water quality in the evaluation of stream sites. *Reg. Sci. Res. Inst. Work. Pap.*, 100 p. *Reg. Sci. Res. Inst.*, Phila., Pa.

Abstract

"Twelve subjects were taken to 12 stream sites varying in water quality, but generally similar in other respects. The subjects included eleven females and one male; all were adult, white, middle-class suburban residents. The subjects recorded, in response to questionnaires, their liking or disliking of the area, and their perceptions of aspects of the areas such as water quality and suitability for park development. Personal background information was also obtained from the respondents. The streams were rated by three trained observers for visual signs of pollution, and water samples were analyzed.

Results showed that respondents did recognize pollution, but that they did not take it into account when expressing their preferences for the stream sites. Water pollution did have an effect on perceived suitability of areas for water-related activities (wading, fishing), but not for non-water-related activities (relaxing, enjoying the scenery, picnicking)." No refs.

Scherer, Ursula, and Robert E. Coughlin.

1972. A pilot household survey of perception and use of a large park. *Reg. Sci. Res. Inst. Discuss. Pap. Ser. Number 59*, 51 p. *Reg. Sci. Res. Inst.*, Phila., Pa.

Abstract

A questionnaire was distributed to residents living around a 1294 acre park. The survey asked for evaluations of various characteristics of the park, indications of park use, and socioeconomic characteristics of the respondents. 31 refs.

Headings

Perception of the quality of the park; Relationship between perceptions of quality and other variables; Conceptualization of role and importance of the park; Relationships between role of the park and other variables; Effect of park on property value; Importance of park to choice of residential location; Actual property values.

Sewell, W. R. Derrick.

1971. Environmental perceptions and attitudes of engineers and public health officials. *Environ. and Behav.* 3:23-59.

Abstract

Presents two studies concerning experts' perceptions of the problems of environmental quality and the solutions which they recommend. Thirty engineers and 40 public health officials in British Columbia were interviewed. Open-ended and forced-choice questions were used. In some cases, questionnaires were left with the respondents. Factor analysis isolated 21 variables from the response lists. Results suggest three changes need to be made: (1) environmental problems should be viewed holistically (e.g., water pollution should not be isolated from air and land pollution), (2) the public should be involved in planning, and (3) administrative structures, laws, and policies should take a broader view. 31 refs.

Sewell, W. R. Derrick.

1974. Perceptions, attitudes and public participation in countryside management in Scotland. *J. Environ. Manage.* 2(3): 235-257.

Abstract

"This paper reviews evidence presented to the committee (Select Committee on Scottish Affairs) as to perceptions of various groups of appropriate uses of the Scottish countryside, and attitudes as to the appropriate note (sic) of the public policy-making. It describes two experiments in public participation undertaken in North America and offers a number of suggestions of studies that might be carried out to determine possible improvements in the public consultation process in Scotland."

One study on water quality in Denver brought together individuals from over 100 interest groups. Using an open response format, participants evaluated four water quality objectives submitted by the study staff.

The other study employed various techniques to obtain inputs from the public at each phase of the planning process: questionnaires, content analysis of news media, workshops, public meetings, public hearings, and referenda. Different techniques seemed to be more effective at some stages than at others.

Author concludes that more accurate measures of public preference and better planner-manager communications are needed. 39 refs.

Sewell, W. R. Derrick, and B. R. Little.

1973. Specialists, laymen, and the process of environmental appraisal. *Reg. Stud.* 7:161-171.

Abstract

"This paper examines one critical factor, specialization, and indicates the role it can play in undermining the presumed objectivity of appraisals. A conceptual framework for looking at the appraisal process as a socially legitimated form of environmental construing is set forth, and links with the environmental perception literature made. Several new methods for assessing 'psychospecialization' variables are outlined, together with a summary of some preliminary empirical studies." 31 refs.

Shafer, Elwood L., and Hubert D. Burke.

1965. Preferences for outdoor recreation facilities in four state parks. *J. For.* 63(7):512-518.

Abstract

"Personal interviews were conducted on four state parks in northeastern Pennsylvania to measure the direction and amount of the demand for outdoor recreation facilities such as swimming beaches, picnic areas, fireplaces, sanitation facilities, campsite spacing, and camping facilities. A photo-choice method that included a value assessment (1¢ to \$4.50) for the specific choice was used in the survey. Preference patterns were found to be consistent for the various facilities, so similar choices could be expected in comparable recreational situations. On both weekdays and weekends, campers differed significantly from noncampers in their preference patterns for swimming areas, fireplaces, camping facilities, and campsite spacings." No refs.

Critical Comments

Costs were too low to develop demand functions. Costs and facilities were confounded so that preferences for each cannot be identified, i.e., preferences are given for a particular facility at a particular price.

Shafer, Elwood L., Jr., John F. Hamilton, Jr., and Elizabeth Schmidt.

1969. Natural landscape preferences: A predictive model. *J. Leisure Res.* 1(1):1-19.

Abstract

An analysis of the public preferences for landscapes is made by having randomly selected Adirondack campers rate, on a 5-point scale, a randomized packet of 20 professional photographs. A total of 100 photographs which are "representative views of typical wildlands in the U.S.—excluding seashore scenes" are rated by respondents until there are 50 rankings for each picture. The results of the rankings are used as the data base in developing a mathematical model correlated with 46 variables identified by the authors as factors which comprise landscape descriptions. Using factor analysis and multiple regression, a 6 variable equation is developed. When field tested with a new set of pictures, the mathematical model accounted for 66 percent of the preference scores for photographs of landscapes. Possible application of the model to management and planning studies are explained. Appropriate discussion of possible modification of procedures reflecting potential impact of various management strategies is also considered. 4 refs.

Critical Comments

Comments by E. Gordon West. *J. Leisure Res.* 1(2):195. 1969. 1. The use of professional photographs biases the study, for a professional photographer seeks to interpret landscapes through his selection of scenes. 2. Black and white photographs decrease significantly the esthetic appeal of some landscapes, e.g., the Painted Desert of Arizona. 3. "The submission that their method 'can be used to help evaluate and compare the aesthetic quality of different landscapes' is highly questionable," without comparison of preferences for the photograph and the actual landscape. Shafer's reply, *J. Leisure Res.* 1(2):197-198, 1969. 1. The 100 photographs were taken by many different photographers—in effect drawing our sample of 100 photos from an infinitely large number of photographer-scene combinations. 2. Black and white photographs were used to minimize costs. It is hoped that someone will replicate the study using color as an additional variable. 3. An onsite comparison of "preferences for scenes with preferences for photographs of the same scenes. . . would be very useful in aesthetic research."

Additional Comments

The variables selected for the factor analysis were generated from measurements of areas, perimeters, etc., on the photographs themselves, which may overemphasize photographic rather than physical site variables. Even if photographic sampling is valid (and there are indications that it is), such variables may not be the determinants of landscape preferences of onsite viewers.

Headings

Measurement of landscape variables; Landscape zone descriptions; Landscape zone dimensions; Tonal variables; Interview procedures; Model formulation; The data analysis model; Field test procedures; Methodology; Discussion of results; Strength of the model; Weakness of the model; Application of the model.

Shafer, Elwood L., Jr., and James Mietz.

1970. It seems possible to quantify scenic beauty in photographs. USDA For. Ser. Res. Pap. NE-162, 12 p. Northeast For. Exp. Stn., Upper Darby, Pa.

Abstract

The mathematical model developed by Shafer and others for the Northeast that modeled the scenic component of landscapes is field tested in the West (Wasatch National Forest near Salt Lake City). Fourteen photos were randomly chosen from the original 100 photos used in the development of the model. These photos were shown to residents of Salt Lake City who were day users in the Wasatch National Forest. The photographs were

divided into two packets of seven each. Each respondent was asked to rank the landscapes from 1 to 7 in order of preference. Every photograph was rated 50 times, thus its scenic quantified rating ranged from 50 to 350. The respondents' ratings of photographic landscape preference were compared to that predicted by the variables in the model. Respondent ratings were generally within one rank unit. 4 refs.

Critical Comments

The predictability of the model might be tested against photographs not used in the development of the model to show that the variables identified by the model are universal in affecting photo landscape preference. Landscape preference also should be field tested.

Shafer, Elwood L., Jr., and George Moeller.

1971. Predicting quantitative and qualitative values of recreation participation. *In Recreation Symposium Proceedings.* p. 5-22. U.S. Dep. Agric. For. Serv. Northeast For. Exp. Stn., Upper Darby, Pa.

Abstract

"Management and research responsibilities for meeting recreation demand are discussed, and proved methods for forecasting recreation use and associated qualitative values are presented. The best approach for developing recreation-participation rate equations may be to include a distance factor, recreation-supply variables, socio-economic measurements of users and non-users, qualitative measures of recreation environments—all in the same model. The effects of technological progress on values and behavior patterns are described, and methods for forecasting relevant technological advances are outlined." 47 refs.

Critical Comments

Authors recognize that scenic quality is only one variable affecting site use and propose a model that treats all the use variables.

Shafer, Elwood L., Jr., and Thomas A. Richards.

1974. A comparison of viewer reactions to outdoor scenes and photographs of those scenes. USDA For. Serv. Res. Pap. NE-302, 26 p. Northeast For. Exp. Stn., Upper Darby, Pa.

Abstract

"A color-slide projection or photograph can be used to determine reactions to an actual scene if the presentation adequately includes most of the elements in the scene. Eight kinds of scenes were subjected to three different types of presentation: (A) viewing the actual scenes, (B) viewing color slides of the scenes, and (C) viewing color photographs of the scenes. For each scene, responses to each of the three treatments were compared statistically and graphically." 7 refs.

Critical Comments

Authors found that, with reasonable caveats, color-slides or pictures can adequately represent landscapes; in this regard, see further empirical evidence presented in Daniel and Boster (1976, see p. 15).

Scenes included factories, junkyards, railroad tracks, etc. Only two scenes were not dominated by manmade elements. However, this technique may be applicable to less variable scenes, e.g., natural landscapes, though less complex methods (e.g., ratings on a single scale of scenic beauty) may differentiate between scenes as well. Study is similar to that of Zube et al. (1974, see p. 26).

The professional layout of this publication shows that research results can be presented in a highly readable manner.

Shafer, Elwood L., Jr., and Roger C. Thompson.

1968. Models that describe use of Adirondack campgrounds. *For. Sci.* 14(4):383-391.

Abstract

Mathematic models are developed to study "the relationship between camper use and 40 site characteristics of 24 Adirondack campgrounds. Factor analysis identified nine factors that conveyed all the essential information in the original set of 40 site variables. Regression analysis related average annual visitor-days per campground to factors containing campground size and associated water-recreation variables." Esthetic and other non-monetary values are implicit in the model and are partially determined through an analysis of the multiple regression predictive equation generated in the study. 7 refs.

Critical Comments

Esthetics may play only a minor role in determining camper use; visitor days depended almost entirely on the number of campsites ($r = .97$). This method could be used as a means of assessing its contribution, though in this particular study esthetic characteristics were not separated from physical site characteristics. Models of this type measure actual behaviors instead of what people say they will do.

Shafer, Elwood L., and Michael Tooby.

1973. Landscape preferences: An international replication. *J. Leisure Res.* 5(3):60-65.

Abstract

The mathematical model developed by Shafer et al. (1969) was field tested in Scotland. Campers evaluated the original 100 black and white photographs used to determine the six variable prediction equation on a scale of 1 to 5 packets of 20 pictures per respondent. The results support the reliability of the landscape preference prediction equation. It was hypothesized that "a photograph probably can measure on-site preference for a given landscape, if the photographic presentation contains most of the visual variation found in the actual landscape." 2 refs.

Critical Comments

Correlation studies between photographic landscape preference and actual landscape preference could validate the usefulness of the procedure and test this hypothesis.

Sinden, J. A.

1973. Utility analysis in the valuation of extra-market benefits with particular reference to water-based recreation. WRR1-17, 124 p. Water Resour. Inst., Oreg. State Univ., Corvallis, and Water Resour. Res. Cent., Univ. of Mass., Amherst.

Abstract

"... a photo-choice game to obtain cardinal estimates of preference or taste was developed from the theory of consumer choice. Taste was measured as willingness to pay extra fees and extra hours of travel. ... Demand functions were calculated for ten recreation activities. These functions were used to validate estimates of preferences. Participation in the activities was responsive to both distance—as a proxy for price—and to utility. But it was more responsive to taste. This result suggested the need to modify the traditional travel-cost procedure for valuing recreational benefits." 48 refs.

Headings

Benefit evaluation in principle and in practice; A general economic framework; Data collection; Derivation of demand

curves with the travel cost method; Indifference mapping for benefit values; Valuing option demand.

Sinden, J. A.

1974. A utility approach to the valuation of recreational and aesthetic experiences. *J. Agric. Econ.* 56(1):61-72.

Abstract

A method for valuing extramarket benefits is proposed and tested. The method rests on the empirical derivation of utility functions and indifference maps. Demand schedules were obtained from the indifference maps to provide specific benefit values. The method is compared to the conventional travel-cost method for valuing recreational benefits. It is argued that the utility approach is conceptually superior. Also, the utility data comprises both the benefit values from the indifference maps and direct survey responses as surrogates for utility. These data proved better predictors of consumption than the usual travel-cost variables. 11 refs.

Singh, Raghu N., and Kenneth P. Wilkinson.

1974. On the measurement of environmental impacts of public projects from a sociological perspective. *Water Resour. Bull.* 10(3):415-425.

Abstract

"... In an attempt to bring some empirical focus into this field [environmental impact measurement from sociological perspectives], attitudinal measures were employed to discover how residents of a river basin perceived negative and positive environmental impacts of a proposed watershed development project. ... Data on 343 heads of household in the selected areas [Texas] were collected through structured questionnaires with items on personal information, a vested interest scale, knowledge of the project scale, and an environmental impact scale. Data show that perception of impacts by residents is influenced significantly by degree of their vested interests involved. Variables for inclusion in a sociological model of environmental impact are suggested." 45 refs.

Critical Comments

That public perceptions should be considered when determining environmental impacts is a good point. Measurement of perceived impacts of completed projects might be more enlightening, especially if perceived impacts were related to the usual physical measures of impacts.

Sonnenfeld, Joseph.

1966. Variable values in space and landscape: An inquiry into the nature of environmental necessity. *J. Soc. Issues* 22(4): 71-82.

Abstract

Using paired comparisons of colored slides, various groups of respondents (Eskimos, Alaskan non-natives, high school and college students) indicated environmental preferences for living, camping, or visiting. Preliminary results suggest: (1) landscape and space represent different environmental experiences, (2) populations differ in environmental perceptions, (3) adjustment and adaptation efforts to improve landscape quality for natives may be wasted, (6) non-natives may never be satisfied, (7) the real problems of the future environment are ecological.

Critical Comments

This is a good discussion of adaptation. Man may indeed adapt to declining landscape quality; whether he should be required to do so is a value question.

Sonnenfeld, Joseph.

1967. Environmental perception and adaptation level in the Arctic. *In* Environmental perception and behavior. p. 42-59. David Lowenthal, ed. Dep. of Geogr., Res. Pap. 109. Univ. of Chic., Ill.

Abstract

Harry Helson's Adaptation-Level Theory (1964) is suggested as an explanation for the varying environmental perceptions among northern Alaskan populations. The methodology of the Arctic study consisted of a questionnaire, a semantic differential test, and a photo slide test. Subjects were shown pairs of slides which depicted "one or more of the four basic dimensions—topography, water, vegetation, and temperature" in various landscape settings. Each subject was to select the landscape he preferred. A quantitative landscape scale was established by three judges who rated each picture on the four dimensions using a scale of 1 to 3 for each dimension. Choice differences due to sex, age, native/non-native, location in Alaska (variation among villages) and in Alaska versus Delaware (see following abstract), and previous environmental experiences are reported. Results suggest that landscape preferences change as one experiences new environments. 3 refs.

Sonnenfeld, Joseph.

1969. Equivalence and distortion of the perceptual environment. *Environ. and Behav.* 1:83-99.

Abstract

A semantic differential technique (based on Osgood et al. 1957) was devised to determine "what it is that constitutes the environment to which a population is sensitive. Concept variables provide the focus, and in this test represent the environmental elements that are being analyzed for the different meanings they have for different populations. . . Physical concepts. . . included. . . snow, rain, fog, wind, sunshine, night, clouds, summer, winter, spring, fall, moon, sun, and northern lights." Twenty-five bipolar scales (e.g., like-dislike, hot-cold, etc.) were used to define the physical concepts [on a five-point bipolar scale (-2,-1,0,1,2)]. An analysis of scales grouped into the functional categories of adjustment factor, attractiveness factor, and wilderness factor was performed. Based on the results of numerous tests of several population samples, "an 'environmental personality type' is postulated that will be found among all populations, regardless of the contrast in cultural values otherwise distinguished between them, and regardless of the contrasts in environments they occupy." Work is also reported on a personality inventory. "Environmental personality may prove the key to between-population similarity in environmental behaviors even as it provides a basis for understanding within-population differences in these behaviors." 3 refs.

Stankey, George H.

1972a. A strategy for the definition and management of wilderness quality. *In* John V. Krutilla, ed., Natural environments: Studies in theoretical and applied analysis. p. 88-114. Johns Hopkins Univ. Press, Baltimore, Md.

Abstract

A questionnaire was employed to examine four parameters of wilderness use: intensity of use, character of encounters, spatial-temporal aspects, and destructive visitor behaviors. An effort is made to determine how use effects visitor satisfaction and how purist attitudes should effect wilderness management. No refs.

Critical Comments

Contains an excellent discussion of wilderness carrying capacity.

Stankey, George H.

1972b. The use of content analysis in resource decision making. *J. For.* 70(3):148-151.

Abstract

Content analysis is a procedure designed to "record and describe the content of communications such as letters, newspaper articles," or questionnaires. It consists of four steps: (a) selection of response categories, (b) sampling, (c) measurement, (d) analysis. Problems and procedures of content analyses are illustrated by a 1969 analysis of a [National Forest] questionnaire dealing with different recreation development strategies for the Mission Mountain Primitive Area. [The] Coding of responses, cross-classification of variables, and ability to evaluate large numbers of communications are discussed. 6 refs.

Critical Comments

Procedure provides a somewhat objective means to analyzing unstructured verbal inputs. However, coding is time consuming and depends on coders' perceptions.

University of Newcastle Upon Tyne.

1971. Landscape reclamation. p. 127-135. IPC Sci. and Tech. Press Ltd., Surrey, Eng.

Abstract

Referenced pages (chapter 13) present a visual assessment of reclaimed landscape based on the work of J. J. Ffennell and others. 11 refs.

Selected Headings

Appreciation of landscape; Method of analysis; Government policy towards the environment of the North East; Visual results of landscape reclamation; Questionnaire on visual analysis; Attitudes to the site before reclamation, — during reclamation, — since reclamation; Suggestions for improvement; Questionnaire — as environmental quality indices.

Wenger, Wiley D., Jr., and Richard Videbeck.

1969. Eye pupillary measurement of aesthetic responses to forest scenes. *J. Leisure Res.* 1(2):149-161.

Abstract

"The relationship between eye pupillary responses and aesthetic reactions to forest scenes was explored. The objective was to find an improved method for revealing the direction and degree of emotional response in landscape aesthetics research. It was predicted from Hess's affect hypothesis that campers dilate more to landscapes than do non-campers and that females dilate more than males. Analyses of variance of 32 subjects' responses to 25 landscape slides revealed reliable differences between campers and non-campers, though the direction of the differences was opposite to predictions. On the basis of the findings, the authors speculate that an information-processing hypothesis may account for observed pupillary responses better than Hess' affect hypothesis. It was concluded that pupillary measures are useful in exploring new facets of aesthetic responses, but that another autonomic measure might be as useful without having as many inherent technical and physiological problems." 23 refs.

Critical Comments

There is evidence suggesting that campers and noncampers may share the same landscape preferences. But the reliable differences between campers and noncampers in a direction opposite of that predicted by the author may suggest that some sort of adaptation of interest factor may be playing a role. Effort to obtain a reliable physiological measure of preference is commendable.

Wohlwill, Joachim F.

1968. Amount of stimulus exploration and preference as differential functions of stimulus complexity. *Percep. and Psychophys.* 4:307-312.

Abstract

"Two sets of photographic slides, one made up of scenes from the geographic environment, the other of works of nonrepresentational modern art, were scaled for complexity by obtaining judges' ratings of amount of variation presented on several specified stimulus attributes. Fourteen slides defining a seven-point scale of complexity were selected from each set and given (sic) to college students to obtain measures of (a) amount of exploratory behavior (number of times S chose to expose each slide briefly), and (b) preference (evaluative ratings on a seven-point scale). In accordance with prediction, the former measure emerged as a linearly increasing function of complexity, while the relationship between complexity and preference was curvilinear, reaching a maximum at an intermediate level of complexity. The results are related to Berlyne's distinction between specific and diversive stimulus exploration, and implications for the study of aesthetics are discussed." 15 refs.

Critical Comments

The effort to validate complexity as an important determinant of landscape esthetics is commendable in that complexity is often included in intuitive models. See Kaplan, Kaplan, and Wendt (1972, p. 18) for a follow-up study.

Zube, Ervin H.

1973a. Scenery as a natural resource: Implications of public policy and problems of definition, description, and evaluation. *Landscape Archit.* 63(2):126-132.

Abstract

The state of the art in evaluating scenery as a natural resource is discussed. Several procedures developed in the later 60's and early 70's are noted and the need to incorporate more communicability, credibility, and predictability into scenic assessment procedures is emphasized. The need to develop improved techniques that "identify those aspects of scenery which mean something to the broadest range of people. . . and evaluative scales that are stable enough to influence a wide range of decisions when we allocate the resources that make a scene" are the keys to giving the scenic component of resources fair consideration in planning and management implementation of natural resources. No refs.

Zube, Ervin H.

1973b. Rating everyday rural landscapes of the Northeastern U.S. *Landscape Archit.* 63(4):371-375.

Abstract

Attempts to assess the degree of agreement between different groups of people on the evaluation of slides of rural landscapes. Nine of 27 slides were drawings that could be manipulated. Real world slides were selected for systematic variation on some variables. Participants were asked to select the slide with the highest scenic value from slide pairs and to describe 4 slides using 14 semantic scales.

The results revealed substantial evaluative agreement between groups of designers, resource managers and technicians, students, housewives, teachers, and secretaries. In most groups responses to real world slides differed from the responses to drawings. Scenic value seems to increase with increasing land use diversity. No refs.

Zube, Ervin H.

1974. Cross-disciplinary and intermode agreement on the description and evaluation of landscape resources. *Environ. and Behav.* 6:69-89.

Abstract

A study of the similarities and differences of two modes of landscape analysis, (1) field reconnaissance and (2) office study using aerial photographs and topographic maps, and two distinct professional populations of evaluators, environmental designers and resource managers. Landscapes were described and evaluated by: (1) 25 semantic scales, (2) unstructured descriptions, (3) rank ordering by scenic quality.

"Both the factor analysis of the semantic scale data and the rank ordering of the aerial photographs indicate meaningful levels of agreement between groups on evaluation regardless of mode of analysis. . . There is reason to believe, therefore, that communication about scenic resources is possible in meaningful terms without resort to a pseudo-professional jargon and without the invocation of an aesthetic elitism." Some "potentially important" methodological differences were noted, however; "field analysts" focus on materials and objects, while "office analysts" focus on the spatial distribution of these materials and objects. 21 refs.

Critical Comments

The tendency of office analysis to focus on spatial distribution may be a function of the aerial photographic presentations. Would eye level photos, simulating the experiences of field analysts, produce the same results?

Zube, Ervin H., David G. Pitt, and Thomas W. Anderson.

1974. Perception and measurement of scenic resources in the Southern Connecticut River Valley. *Inst. Man and His Environ.* Publ. Number R-74-1, 191 p., *Inst. Man and His Environ.* Amherst, Mass.

Abstract

Thirteen groups of professional and nonprofessional participants were asked to evaluate and describe 8 landscapes by using a 51-feature check list and 18 semantic scales. Some subjects evaluated the sites in the field, while others viewed panoramic photographs of the site. All participants also rank ordered, according to scenic quality, the 8 views and sorted 56 other color photos into 7 piles representing 7 levels of scenic quality. The authors then analyzed all areas on 23 quantifiable dimensions. Analyses of the findings revealed a high correlation between the evaluations of field observers and photograph observers. Generally impressive levels of agreement were found among the thirteen subgroups on all measures of landscape quality (with the possible exception of inner-city residents). Six landscape dimensions accounted for 51.4 percent of the variance. 44 refs.

Critical Comments

Very thorough presentation of an extremely comprehensive study, though it could be better organized. Some very interesting conclusions often running counter to intuitive expectations are presented. The semantic scales tend to give little information, however. Preferred environments tend to be described in terms of positive weightings on the semantic scales, e.g., beautiful (vs. ugly), inviting, like, tidy, etc. Such descriptors may be redundant of preference.

MISCELLANEOUS

This section includes papers taking a variety of viewpoints and approaches. Some are economic analyses or computer mapping techniques. Others focus on the scenic beauty of highway environments. Still others are suggestions for research strategies, but offer no specific techniques.

Benson, Robert D.

1974. Lodgepole pine logging residues: Management alternatives. USDA For. Serv. Res. Pap. INT-160, 28 p. Intermt. For. and Range Exp. Stn., Odgen, Utah.

Abstract

"The dollar and nondollar effects of alternative levels of residue utilization in mature lodgepole pine are compared. Net dollar returns were greater in conventional logging (removal of green sawlogs to a 6-inch top with slash piled and burned) than in near complete harvesting (sawlog removal followed by field chipping of remaining wood material on the site). However, substantial nondollar benefits were gained by near complete harvesting, especially in esthetics, full reduction, and site preparation. Continuing studies of harvesting influences upon soil, hydrology, nutrients, and regeneration will further define costs and benefits, and will provide managers with guidelines for harvesting practice decisions." 9 refs.

Critical Comments

Esthetic evaluations were made by using the Daniel et al. (1973) quantification method and by expert judgment. Author notes that "nondollar values expressed along a utility index from 0 to 100 do not necessarily have equal importance. On a given situation, for example, the wildlife considerations may overshadow any of the other nondollar (or dollar!) values involved. When this happens, quantitative analysis must stop and the judgment of the land manager must take over."

Headings

Net dollar values; Esthetic evaluation; Wildlife evaluation; Preliminary regeneration evaluation; Fuels, fire hazards, and burning; Hydrology, soil, and nutrients; Utilization of residues.

Clay, Grady.

1965. The woodland scene: Time for another look. Landscape Archit. 56(1):28-29.

Abstract

A short discussion of "good scenery" and its relationship to certain management practices (e.g., sustained yield). Past management practices of passive protection by the National Park Service are discussed. The need to focus on landscape use—implying an analysis of visual composition, balance, harmony, unity, and contrast of form, identified by Twiss and Litton (1966)—in management practices is emphasized. 4 refs.

Critical Comments

Visual composition variables—balance, harmony, unity, contrast, color, texture—may pose problems for nonlandscape architects unfamiliar and untrained in their use.

Cox, P. Thomas, Adrain L. Haught, and Ervin H. Zube.

1972. Visual quality considerations in regional land use changes. Growth & Change, Apr.:9-15.

Abstract

This paper discusses a method of incorporating environmental concerns, e.g., visual quality, into a multiobjective planning framework. The study area was the North Atlantic Region including the James River Basin (Virginia) and all or parts of thirteen northward states which drain into the Atlantic. The area was first inventoried according to a system that distinguished land form and landscape pattern. Using criteria based on diversity of land use and three-dimensional contrasts of the land form, the landscapes were then evaluated by consulting landscape architects. Two linear programming runs (the objective function was to minimize total costs), one with and one without the visual quality constraints, provided quantitative estimates of the differences in costs between obtaining the visual quality objective and obtaining the economic efficiency objective. The output included land use distribution changes under the visual quality constraints. Further research into the tradeoffs inherent in multiobjective planning is suggested. 7 refs.

Critical Comments

A sound, if preliminary, approach to assessing the costs of providing visual quality vs. economic efficiency. The visual quality rating system used was crude (3 levels—high, medial, low—judged by architectural consultants). Management costs were clearly higher when visual constraints were added.

Davidson, Paul.

1967. An exploratory study to identify and measure the benefits derived from the scenic enhancement of federal-aid highways. Highw. Res. Rec. 182:18-21.

Abstract

The study focuses on the benefits of scenic enhancement of highways for pleasure driving. A multiregression analysis (based on an independent and earlier household survey) was performed to isolate "significant variables that influence the desire to engage in pleasure driving." Conclusions based on income, age, sex, race, and location are reported. Only direct engineering costs along the roadway are discussed and scenic components of highway environments are not identified. No refs.

Critical Comments

While the variables may be correlated with the occurrence of driving pleasure, they may not indicate the desire to do so.

Elsner, Gary H.

1971. Computing visible areas from proposed recreation developments. . . a case study. USDA For. Serv., Res. Note PSW-246, 10 p. Pac. Southwest For. and Range Exp. Stn., Berkeley, Calif.

Abstract

"A new computerized technique called VIEWIT for measuring the terrain visible from a given point was applied in a study on the Black Hills National Forest, South Dakota. The seen area from 12 heavily visited scenic points and along three proposed routes for a scenic tramway were delineated. The computer produced overlay maps that show the maximum area visible from each observation point." 2 refs.

Ferris, Kimball H., and Julius Gy. Fabos.

1974. The utility of computers in landscape planning: The selection and application of a computer mapping and assessment system for the Metropolitan Landscape Planning Model (METLAND). Mass. Agric. Exp. Stn. Res. Bull. Number 617, 116 p. Coll. Food and Nat. Resour., Univ. Mass., Amherst.

Abstract

"This study was undertaken to select a computer manipulating and mapping system to improve the existing technique. . . The initial landscape resource assessment portion of the study was designed to evaluate available earth resource and land use data. . . An isopleth mapping procedure was employed to assess the geographic distribution of the resource values and the magnitude of resource value change. . . ." 57 refs.

Headings

State of the art of geographic information systems; Selection of a digitizing system; Application of COMLUP; Comparison of analysis techniques.

Fuhriman, Jerry W.

1973. An overview: The development of aesthetic opportunity criteria as it relates to the planning process. *In* Toward a Technique for Quantifying Aesthetic Quality of Water Resources, p. 22-31. Perry J. Brown, ed. PRWG-120-2. Utah State Univ., Logan.

Abstract

Esthetic quantifications systems should meet the following criteria: "a) The quantification system should provide a means for giving value to the relationship which exists between aesthetic opportunity and inherent quality. b) The quantification system should be developed in such a way as to give insight regarding aesthetic opportunity as it relates to a given broad scale region. c) The quantification system should be developed to achieve insight regarding to aesthetic opportunities that exist in relation to a given function and a specific landscape/waterscape. d) The quantification system should be readily adaptable to any planning methodology." Several studies (especially Murray et al. 1971) are discussed with reference to the four criteria. 5 refs.

Critical Comments

Criteria a, b, and c are stated in general terms only.

Headings

Current planning methods; Attractiveness vulnerability-impact; Leopold scheme: A digression.

Garthwaite, P. E.

1971. Forest management for conservation, landscaping, access, and sport. Res. and Dev. Pap. Number 81, 20 p. For. Comm., London.

Abstract

Presents a general discussion of the costs and benefits of landscape design. 10 refs.

Critical Comments

Notes that increasing scenic beauty may cost little in lost revenues from economic yields. What it *will* cost is more planning time.

Headings

The size and scope of the problem; Change in woodland area; Timber production; The changing landscape problems of forestry; The constraints; Achieving practical results in forest landscape design; Future trends.

Goodey, B., D. Donnelley, M. Menzies, and D. Spencer.

1973. The Teme Valley scenic route: An informal assessment. Work. Pap. Number 9, 20 p. Univ. of Birm., Eng.

Abstract

An informal, direct evaluation of the scenic route also studied by Dunn (1973, see p. 16).

Grodzik, R. M., H. E. Jackson, and A. E. Rattray.

1973. An evaluation of water landscapes. 129 p. Agassiz Cent. Water Stud. Univ. of Manit., Winnipeg, Can.

Abstract

Assesses the "GRID ANALYSIS" technique (computer-aided mapping) for resource evaluation and land use allocation. Site suitability for 12 land uses and sensitivity to 7 land use interventions are mapped. Values are determined by professional judgment based on physical site characteristics. 36 refs.

Hornbeck, P. L., R. R. Forster, and M. R. Dillingham.

1969. Highway aesthetics—functional criteria for planning and design. *Highw. Res. Rec.* 280:25-38.

Abstract

"This report examines the function and use of aesthetic criteria for the highway development process. . . The major premise established for procedure of the study is that 'aesthetics' is not an additive to the process of highway planning and design but must be identified and implemented as an integral component.

The research report identifies the visual parameters of the highway planning process related to a range of disciplines; evaluates them for their relevance to improved highway appearance and use, and driver behavior; suggests a methodology to identify and integrate visual and behavioral criteria for a more complete highway planning process; and applies this methodology in a demonstration case study." 3 refs.

Critical Comments

Visual analysis is in terms of the interaction of duration and incidence of five visual elements: edge, enclosure, objects' dominance, alinement, and diversity. Visual quality is treated as the ability of drivers to view the environment and the effects of the view on driver behavior. This is not the same as scenic quality (and is not meant to be).

Hornbeck, P. L., and Garland A. Okerlund.

1972. Visual quality for the highway user: A study of the relation of factors of visual quality to route design. *Highw. Res. Rec.* 410:52-63.

Abstract

According to the authors, "qualitative experience potentially available from the highway environment" is to be provided through highway alinements by allowing views of various durations. Four problems that summarize the visual and esthetic aspects of the driving experience are identified. A descriptive procedure for integrating these components into the planning process (through the use of inventory, guideline, and resolution maps) is suggested. Provincetown on Cape Cod is used as a sample site to illustrate the mapping technique. 26 refs.

Kates, Robert T.

1966. The pursuit of beauty. *Proc. Symp. Nat. Beauty*, p. 34-50. [Ohio State Univ., May 24, 1966.]

Abstract

The goals of environmental management consist of three fundamental factors: physical and mental health, sensory and participatory pleasure, and economic value. Beauty is demonstrated to be a constituent part of each of these factors. The management of public spaces through public involvement should be designed to decrease ugliness by identification of contextual environmental misfits. The hope for attaining beauty lies in the employment of experts who can provide access to the "rare and unique" experience of beauty. According to the author, experts are needed to inject beauty into the landscape or townscape by (1) identification and preservation of the beautiful and good that already exists; (2) provision of accessibility to existing but unseen beauty; (3) the design of landscape and townscape beauty. 11 refs.

Critical Comments

Certainly points 1 and 2 (above) can be determined by the public and the public can also have input into point 3. Kates' view of beauty is very restrictive and many will disagree that only experts can show the path.

Headings

Introduction; The new conservation; Beauty and the goals of environmental management; Beauty in nature and art: The artificial-natural dichotomy; Beauty and the private sector; The measurement of beauty—measuring ugliness, beauty, and interest; The provision of beauty; Conclusion: A public policy for beauty.

Johnson, Hugh A., and Jesse R. Russell.

1967. Economics of natural beauty. In Proc. 23rd Annu. Meet. Soil Conserv. Soc. Amer. p. 1-18. USDA Econ. Res. Serv., Wash. D.C. [Des Moines, Iowa, Aug. 13-16, 1967.]

Abstract

A national environmental ethic is needed to support efforts to incorporate and maintain beautification concerns in resource planning and management. The costs and benefits of incorporating beauty in planning implementation are discussed and several examples of development outcomes are cited. 15 refs.

Headings

Beautification in resource planning; Beauty and a resource ethic; Economics in beauty; Beautification in action. [Summary and conclusions.]

Kojima, Michimasa, and J. Alan Wagar.

1972. Computer generated drawings of ground form and vegetation. J. For. 70(5):282-285.

Abstract

"Describes the application of two computer programs that generate perspective views of the landscape, permitting the visual effects of proposed landscape modifications. Perspective drawings of ground form are represented by a grid of distorted squares. . . " by one program while the other program plots ". . . vegetation types, water and clearings as they would appear on the landscape." The location of the observer is flexible, allowing many different perspective views to be considered. 15 refs.

Critical Comments

The procedure is useful only for the experienced landscape planner who can mentally combine the simplified computer images with actual landscapes.

Lansing, John B., and Robert W. Marans.

1969. Evaluation of neighborhood quality. Amer. Inst. Plann. J. 35:195-199.

Abstract

"Efforts to improve neighborhood quality assume that planners can distinguish good from bad neighborhoods and can isolate specific features that are related to overall quality. In this study one hundred clusters of three or four homes scattered through a metropolitan area were rated independently by the people who live there and by an architect-planner. Results show considerable disagreement on the ratings, with people who attended college agreeing with the planner more closely than those with less education. The best single predictor of how well people like a neighborhood is the maintenance level of the structures as rated by the architect-planner." 7 refs.

Lucas, Robert C.

1966. The contribution of environmental research to wilderness policy decisions. J. Soc. Issues 22(4):116-126.

Abstract

The meaning and value of wilderness and the question of how a wilderness remains so if it is used is discussed. Definite management policies must be identified to support the concerns of the professional manager and the public wilderness user. Interdisciplinary environmental research techniques should be developed which identify the esthetic components that make landscapes pleasant or unpleasant and need to be integrated with planning, policy formulation, and management procedures. 16 refs.

Headings

Wilderness and wilderness use; The policy problems; The contribution of environmental research.

Menchik, Mark D.

1971. Residential environmental preferences and choice: Some preliminary empirical results relevant to urban form. Reg. Sci., Res. Inst. Discuss. Pap. Ser. Number 46, 93 p. Reg. Sci. Res. Inst., Phila., Pa.

Abstract

In order to evaluate people's demands for new forms of residential environments (such as cluster development rather than the spread pattern of suburban sprawl), it may be useful to deal with people's residential preferences directly, rather than with their market choice. The paper develops residential environmental preference variables from questionnaire survey data. The preferences may be thought of as relative tradeoffs among [the] residence accessibility, characteristics of the house and lot (e.g., lot size), [the] quality of the natural environment, and characteristics of the nonnatural environment (e.g., population density). At the same time, comparable measures are devised for the characteristics of the respondents' present residential choices. 26 refs.

Michelson, W.

1966. An empirical analysis of urban environmental preferences. J. Am. Inst. Plann. 32:355-360.

Abstract

Respondents were shown photographs of urban environments and asked to rank them for preference and give open ended evaluations. Then they were asked to describe their ideal of an urban environment, as well as their past experiences with urban settings. The relationship between social variables and physical environmental preferences is discussed. No refs.

Murison, W. F.

1965. Landscape forestry: A new profession. *Landscape Archit.* 56(1):30-31.

Abstract

Argues for a joint forestry profession that combines an economic orientation with that of a landscape architect, thereby managing forests with a simultaneous concern for economics and esthetics. The need for multiple use of forests is identified with special focus on high population density regions of the U.S., e.g., the Northeast. 4 refs.

Newby, Floyd L.

1973. Indicators for aesthetic opportunity. In *Toward a Technique for Quantifying Aesthetic Quality of Water Resources*, p. 76-87. Perry J. Brown, ed. PRWG-120-2. Utah State Univ., Logan.

Abstract

The author argues that esthetic opportunities must be determined from an analysis of human needs as they relate to environmental order and complexity. The development of planning models should focus on "defining organizational elements within an environment which alters behavior and then developing a predictive model to assess the direction of behavioral responses." Management policies based on social norms are viewed as constraints on some individual's optimum growth and self actualization. 8 refs.

Critical Comments

Discussion is based on unvalidated assumptions of man's psychological "needs," drawn from Maslow's personality theory. Some general recommendations for research are included, but no specific proposals for esthetic management are discussed.

Pearson, P. M., and W. A. McLaughlin.

1968. Toward design criteria for highway aesthetics. *Highw. Res. Rec.* 232:9-15.

Abstract

"A framework of investigations into design criteria which will not only include the traditional Newtonian Criteria but measurable aesthetic considerations from the driver's point of view is established. The driving task is developed as a system. The inputs are perceived by the driver, a value judgment is made and outputs are produced. The experimental method suggested deals with the value judgment. It is suggested that the driver's outputs are a reflection of his state of mind. The galvanic skin response and other apparatus are suggested to measure these outputs. By relating the state of mind or an acceptable level of risk to geometric elements, design criteria can be developed to allow the driver freedom to enjoy the beauty of the environment. Until this is accomplished, there is little logic in providing, at additional costs, so-called aesthetic qualities in design." 11 refs.

Critical Comments

E. H. Geissler and A. Aziz, Department of Highways, Ontario, Canada, suggest that the authors consider the following points in their design criteria: "a) the view the highway offers to the onlookers across the environment the highway passes through, b) the view of the driver across the environment as he travels along the roadway."

Author's Reply: "This paper was confined to the relationships between the driver and the structural and geometric elements of the roadway. We felt that until there is a feeling of

security on the part of the driver, there was no point in beautifying the roadway for his benefit. This was a stated constraint in that we did not consider the nondriving population."

Additional Comments

Authors recognized that tradeoffs may have to be made between service, safety, cost, and beauty and anticipated Geissler and Aziz's criticisms.

Peterson, George L.

1967. Complete value analysis: Highway beautification and environmental quality. *Highw. Res. Rec.* 182:9-17.

Abstract

A philosophical definition of esthetics is introduced as a measure by which one can identify beauty. Three reasons for including environmental beautification concerns in engineering projects are discussed within the context of economics and art. An equation that defines visual quality (beauty) as a function of "sound physical quality, harmony with nature and variety" is developed and presented as a way to assess the beauty of residential neighborhoods. General recommendations to incorporate esthetic concerns into the planning process include adding landscape architects, architects, designers, and the general public to the decision process. The "beauty" of billboards is also discussed. 12 refs.

Critical Comments

The "complete value analysis" referred to in the title is misleading because the analysis is probably incomplete. The analysis procedure is also value laden with the author's own preconceived esthetic standards.

Headings

Searching for a model; Highway beautification; Engineering; Economics and Art; Toward some specific answers; General recommendations; Billboards.

Schechter, M., and M. Barnea.

1973. The expenditures on nature and landscape. *J. Environ. Manage.* 1:393-404.

Abstract

"This investigation presents data on the scope of public resources allocated to nature and landscape conservation (NLC) in Israel during the years 1960-69. The activities of public bodies are estimated in terms of both absolute and relative levels of public funds allocated for this purpose. Comparisons are also made between Israel and several Western European countries. The main question arising out of the analysis is whether the allocations to NLC activities indeed reflect prevailing social preferences. The writers suggest that perhaps this is not the case, and offer several explanations for the apparent discrepancy." 9 refs.

Snow, W. Brewster (ed.).

1959. *The highway and the landscape*. 230 p. Rutgers Univ. Press, New Brunswick, N.J.

Abstract

Authors with diversified [but relevant] backgrounds comment in general terms on landscape design as related to highway design. No refs.

Headings

The complete highway (Spencer Miller, Jr.); The parkway idea (Gilmore D. Clarke); The challenge of the new highway pro-

gram (Charles A. Glover); They planned a suburb well (Jay Dugan); The art of fitting the highway to the landscape (F. W. Cron); Preserving the scenic qualities of the roadside (Wallace A. Johnson); Good highway design is economical (Oliver A. Deakin); The new highways and property values (Edward A. Sprague); Zoning for roadside protection (Erling D. Solberg); Politics and road building (Joseph C. Ingraham); The functional uses of plants on the complete highway (Richard P. White); Suggested plant materials (Richard P. White).

Tybout, Richard.

1966. The problem of collective choice in aesthetic matters. Proc., Symp. Nat. Beauty. p. 51-63. [Ohio State Univ., May 24, 1966.]

Abstract

Various approaches (based on previously developed economic techniques) are proposed to evaluate collective choices relating to esthetics as one component of planning and management decision-making. Sometimes esthetic considerations can be isolated as major decision factors, facilitating decision-making. When esthetics cannot be built into a decision structure, it should be given considerations by explicitly stating esthetic outcomes under various alternative plans. No refs.

Veal, A. J.

1973a. Notes on attraction, preference, and choice in recreation. Univ. Birm. Work. Pap. Number 5, 32 p. Univ. of Birm., Eng.

Abstract

Examines the possibility of studying preference and choice through a comprehensive study of leisure behavior and attitudes, and examines published research on site attraction (trip-distribution models) and questionnaire surveys.

Veal, A. J.

1973b. A discussion of the role of environmental perception in recreation planning, with particular reference to country parks, forests, and sports centres. Work. Pap. Number 10, 64 p. Univ. of Birm., Eng.

Abstract

Discusses further the comprehensive approach to recreation research as put forward in Working Paper 5 and explores the relevance of perception research in the three areas specified.

Wagar, J. Alan.

1964. The carrying capacity of wild lands for recreation. For. Sci. Monogr. 7, 24 p.

Abstract

"This study analyzes the carrying-capacity problems in terms of (1) the impact of the recreation environment on people, (2) the impact of people on the recreation environment, and (3) management procedures to modify these reciprocal impacts. . . It also evaluates the probable effects of crowding on satisfaction. . . Ecological considerations include an experiment in which recreational foot traffic was simulated on a series of vegetated plots." 22 refs.

Critical Comments

Insightful discussion of the problem, but no experimental support for discussion of objectives 1 and 3.

Waller, R. A.

1970. Environmental quality, its measurement and control. Reg. Stud. 4:177-191.

Abstract

"The paper summarizes techniques of (environmental quality) evaluation and puts forward a method by which many diverse aspects of the environment can be related to a common scale which in turn can have a monetary value attached to it. The implications of this philosophy are explored in the context of political decisions relating to planning problems and using traffic noise as an example demonstrates how cost-benefit techniques can be applied to environmental questions." 9 refs.

Warner, Maurice L., and Edward H. Preston.

1974. A review of environmental impact assessment methodologies. Socioeconomic Environ. Stud. Ser., EPA-80015-74-002, 27 p. Off. Res. and Dev., U.S. Environ. Prot. Agency, Wash. D.C.

Abstract

Seventeen tools or methodologies designed for or applicable to the preparation of environmental impact statements are reviewed to identify their strengths, weaknesses, and potential range of use. Specific criteria are suggested for evaluating the adequacy of an impact assessment methodology in terms of: impact identification, impact measurement, impact interpretation, impact communication, resource requirements, replicability, and flexibility.

The reviews presented serve as an introduction to the range of tools available and demonstrate that no single approach to impact assessment is superior in all circumstances. 17 refs.

Winkel, G. H., Roger Malek, and Philip Thiel.

1969. The role of personality differences in judgments of roadside quality. Environ. and Behav. 1:199-223.

Abstract

A study of the factors contributing to visual preferences for roadside development. An environmental "personality" scale was developed which included abstractions from Child's personality scale, attitudes about art, scanning-focusing scales, and statements related to environmental and design attitudes. In addition, 80 observers were asked to evaluate a set of slides of roadside environments using 64 semantic scales. Then they were shown the same slides with roadside artifacts (e.g., billboards) removed and asked to note differences and re-evaluate the slides on the semantic scales. Eye movement recorders were employed to note observers' fixation points.

Factor analysis revealed three factors in the personality scale. Two of the factors were correlated with the slide ratings. 18 refs.

Yi, Fu Tuan.

1967. Attitudes toward environment: Themes & approaches. In Environmental Perception and Behavior. p. 4-17. David Lowenthal, ed. Dep. of Geogr., Res. Pap. 109, Univ. Chic., Ill.

Abstract

This is a brief survey of man's historical attitudes toward the environment. The focus is on man's "world" (as distinct from man's "environment") as depicted in a selected review of historical literature. Man's world is considered from five viewpoints: (1) an individual's attitude toward a particular aspect of environment, (2) an individual's attitude toward a region, (3) an individual's conception of the man-nature synergism, (4) the attitude of people (or peoples) toward environment, and (5) native cosmographies. 46 refs.

Zube, Ervin H., Robert O. Brush, and Julius Gy. Fabos, eds. 1975. *Landscape assessment—values, perception, and resources*. 367 p. Dowden, Hutchinson, and Ross, Inc., Stroudsburg, Pa.

Abstract

Contains articles relating to various aspects of landscape assessment: historic values, perceived values, and values based on landscape inventories. Most of the authors were participants in a conference on landscape assessment, Nov. 15 and 16, 1973 in Amherst, Massachusetts. 608 refs.

Critical Comments

Extensive bibliography is provided.

Headings

LANDSCAPE VALUES: The historic American landscape (John B. Jackson); Qualitative landscape values: The historical perspective (Roderick Nash); This fair land (Calvin W. Stillman); Qualitative values in the landscape (Garrett Eckbo); The economics of a view (Ross S. Whaley); Preservation policy and personal perception: A 200-million-acre misunderstanding (Charles E. Little). LANDSCAPE PERCEPTIONS: Problems of scale and context in assessing a generalized landscape for particular persons (Barrie B. Greenbie); An informal model for the prediction of preference (Stephen Kaplan); Aesthetic factors in visual evaluation (Ian C. Laurie); Some methods and strategies in the prediction of preference (Rachel Kaplan); Individual variations in landscape description (Kenneth H. Craik); Perception and prediction of scenic resource values of the Northeast (Ervin H. Zube, David G. Pitt, and Thomas W. Anderson); Application of a landscape-preference model to land management (Robert O. Brush and Elwood L. Shafer). LANDSCAPE RESOURCES AND MODELS: The regional landscape concept for the Basel Region (Rolf M. Plattner); Landscape assessment of the Upper Great Lakes Basin resources: A macro-geomorphic and micro-composition analysis

(Kenneth J. Polakowski); A landscape assessment-optimization procedure for electric-energy corridor selection (Bruce H. Murray and Bernard Niemann); Model for evaluation of the visual-cultural resources of the Southeastern New England Region (R. Jeffrey Riotte, Julius Gy. Fabos, and Ervin H. Zube); Assessing landscape resources: A proposed model (Wayne D. Iverson); Assessing visual-cultural values of inland wetlands in Massachusetts (Richard C. Smardon); Visual and cultural components of the landscape resource assessment model of the METLAND study (Julius Gy. Fabos, William G. Hendrix, and Christopher M. Greene).

Zuk, William.

1973. Methodology for evaluating the aesthetic appeal of bridge designs. *Highw. Res. Rec.* 248:1-4.

Abstract

Two groups—one professionally trained in areas related to esthetics (e.g., artists, architects, and landscape architects) and the other a random group of nonprofessionals made comparisons of paired line drawings of various bridge designs. The line drawings enabled predetermined factors to be systematically varied while holding other factors constant. "The majority opinion of each group was used to establish the preference position. The results show that aesthetic preference is generally given to such factors as simplicity, slimness, symmetry, conformity to the site, and expressions of out of the ordinary characteristics." The study found the two groups in general agreement on most points of form. 10 refs.

Critical Comments

The findings of this study illustrate the congruence of professional and public esthetic evaluations, frequently reported by other researchers, e.g., see Rabinowitz and Coughlin (1971, p. 21), Zube (1974, p. 26), Daniel and Boster (1976, p. 15).

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